fig-FORTH FOR PACE

ASSEMBLY SOURCE LISTING

RELEASE 1

WITH COMPILER SECURITY

AND

VARIABLE LENGTH NAMES

MAY 1979

```
  1                        .TITLE   FORTH,'NUCLEUS FOR PACE'
  2               ;
  3                        .ASM     TI
  4               ;
  5               PART     =        1
  6               ;
  7                        .LIST    PART=1
  8               ;
  9               ;******************************************************
 10               ;*       THIS IMPLEMENTATION OF THE FORTH LANGUAGE     *
 11               ;*    IS ONE OF A UNIFORM SERIES DEVELOPED BY THE      *
 12               ;*                                                     *
 13               ;*                FORTH INTEREST GROUP                 *
 14               ;*                   P.O. BOX 1105                     *
 15               ;*                SAN CARLOS, CA 94070                 *
 16               ;*                                                     *
 17               ;*       PACE IMPLEMENTATION BY DAVID KILBRIDGE        *
 18               ;******************************************************
 19               ;
 20      0000              .ASECT
 21      0010              .=       0010
 22               ;
 23               ;******************************************************
 24               ;*                 BOC AND FLAG ABBREVIATIONS          *
 25               ;******************************************************
 26               ;
 27      0001     Z        =        1
 28      0002     P        =        2
 29      0003     BIT0     =        3
 30      0005     NZ       =        5
 31      0007     CRY      =        7
 32      0008     LINK     =        8
 33      000A     CSET     =        10
 34      000B     M        =        11
 35               ;
 36               ;******************************************************
 37               ;*                     MEMORY ASSIGNMENTS             *
 38               ;******************************************************
 39               ;
 40      3FC0     HIBLK    =        03FC0        ; HIGHEST BLOCK FWA
 41      2000     LOBLK    =        02000        ; LOWEST BLOCK FWA
 42      0080     BLKSIZ   =        128          ; BLOCK SIZE IN BYTES
 43      0008     NBUF     =        8            ; NO OF BLOCK BUFFERS
 44      2000     TOPMEM   =        02000        ; LWA+1 OF DISK BUFFS
 45      0210     BUFMEM   =        BLKSIZ/2+2*NBUF ; LTH OF BUFFER AREA
 46      1DF0     BUFFS    =        TOPMEM-BUFMEM ; FWA OF DISK BUFFERS
 47      1DD0     UVARS    =        BUFFS-32     ; START OF USER AREA
 48      0100     DICT     =        0100         ; FWA OF DICTIONARY
 49               ;
 50               ;******************************************************
 51               ;*                     START-UP LITERALS              *
 52               ;******************************************************
 53               ;
 54 0010 9811 A   ORÍG:    JMP      @.+1             ; COLD
```

```
 55 0011 088C A            .WORD     CENT      ;   ENTRY
 56 0012 9813 A            JMP       @.+1      ; WARM
 57 0013 0892 A            .WORD     WENT      ;   ENTRY
 58 0014 0000 A  CPU:      .WORD     0         ; RESERVED
 59 0015 0000 A  REV:      .WORD     0         ; RESERVED
 60 0016 0C65 A  FORTHO:   .WORD     TASK-4    ; TOP WORD IN DICT
 61 0017 005F A  BACKSP:   .WORD     005F      ; BACKSPACE CHARACTER
 62 0018 1DD0 A  UO:       .WORD     UVARS     ; START OF USER AREA
 63 0019 1D8F A  SO:       .WORD     UVARS-65  ; TOP OF EMPTY STACK
 64 001A 1DD0 A  RO:       .WORD     UVARS     ; TOP OF RETURN STACK
 65 001B 1D8F A  TIBO:     .WORD     UVARS-65  ; SOURCE BUFFER ORIG
 66 001C 001F A  WIDTHO:   .WORD     31        ; INITIAL NAME LENGTH
 67 001D 0000 A  WARNO:    .WORD     0         ; ERROR WARNING MODE
 68 001E 0C65 A  FENCEO:   .WORD     TASK-4    ; BARRIER FOR FORGET
 69 001F 0C6B A  DPO:      .WORD     FIN       ; FWA OF FREE STORAGE
 70 0020 0843 A  VOCLO:    .WORD     FORTH+4   ; INITIAL VOC-LINK
 71
```

```
                          .PAGE
 72                ;
 73                ;*********************************************
 74                ;*              FORTH REGISTERS             *
 75                ;*********************************************
 76                ;
 77 0021 0000 A  RP:       .WORD     0         ; RETURN STACK PTR
 78 0022 0000 A  UP:       .WORD     0         ; USER POINTER
 79      0002    X         =         2         ; INDEX
 80      0003    Y         =         3         ;  REGISTERS
 81      0001    IP        =         1         ; INTERPRETIVE PTR
 82      0002    W         =         X         ; FORTH CODE PTR
 83      0003    SP        =         Y         ; FORTH STACK PTR
 84                ;
 85                ;*********************************************
 86                ;     INSTALLATION-DEPENDENT ROUTINES
 87                ;*********************************************
 88                ;
 89      7E3B    GETC      =         07E3B
 90      7E44    PUTC      =         07E44
 91      7ECC    INTEST    =         07ECC
 92                ;
 93 0023 5000 A  INIT:     LI        0,0
 94 0024 0800 A            CRF       0
 95 0025 6700 A            PULL      Y
 96 0026 5109 A            LI        1,9
 97 0027 6400 A            PULL      0
 98 0028 79FF A            AISZ      1,-1
 99 0029 1827 A            JMP       .-2
100 002A 3100 A            PFLG      1
```

```
101 002B 6300 A              PUSH       Y
102 002C 1B00 A              JMP        (Y)
103                     ;
104        0000              .BSECT
           00F6              .=.+00F6                     ; POINTER AREA
105        002D              .ASECT
106                     ;**********************************************
107                     ;*       AIDS FOR NAME FIELD CONSTRUCTION      *
108                     ;**********************************************
109                     ;
110                          .FORM   HEAD,1(1),1,1(0),5,1,7
111                     ;
112        0000    ORD  =         0                       ; ORDIN. WD PREC BIT
113        0001    IMM  =         1                       ; IMMED. WD PREC BIT
114        0001    SHORT =        1                       ; FOR 1-CHAR NAMES
115        0000    LONG  =        0                       ; FOR LONGER NAMES
116        8000    EVEN =         08000                   ; EVEN-LTH STOP BIT
117        0080    ODD  =         00080                   ; ODD-LTH STOP BIT
118
```

```
                             .PAGE   'DICTIONARY'
119                     ;
120        002D              .ASECT
121        0100              .=      DICT
122                     ;
123                     ;**********************************************
124                     ;*               LIT, PUSH, PUT, NEXT         *
125                     ;**********************************************
126                     ;
127 0100 834C A              HEAD    ORD,3,LONG,'L'/256
128 0101 49D4 A              .WORD   'IT'+ODD,0000
    0102 0000 A
129 0103 0104 A    LIT:      .WORD   .+1
130 0104 5E40 A              RCPY    IP,X                 ; PICK UP
131 0105 C200 A              LD      0,(X)                ;   VALUE
132 0106 7901 A              AISZ    IP,1                 ; STEP IP OVER
133 0107 7BFF A    PUSH:     AISZ    SP,-1                ; EXTEND STACK
134 0108 D300 A    PUT:      ST      0,(SP)               ; STORE VALUE
135 0109 5E40 A    NEXT:     RCPY    IP,X
136 010A 7901 A              AISZ    IP,1                 ; INCREMENT IP
137 010B CA00 A              LD      W,(X)                ; ADDR OF NEXT WORD
138 010C 9A00 A              JMP     @(W)                 ; JUMP THRU CODE ADDR
139                     ;
140                     ;**********************************************
141                     ;*                    EXECUTE                 *
142                     ;**********************************************
143                     ;
144 010D 8745 A              HEAD    ORD,7,LONG,'E'/256
145 010E 5845 A              .WORD   'XE','CU','TE'+ODD,LIT-3
    010F 4355 A
    0110 54C5 A
    0111 0100 A
```

```
146  0112  0113  A      EXEC:    .WORD    .+1
147  0113  CB00  A               LD       W,0(SP)          ; FETCH CODE ADDR
148  0114  7B01  A               AISZ     SP,1             ; POP STACK
149  0115  9A00  A               JMP      @(W)             ; JUMP THRU CODE ADDR
150                      ;
151                      ;****************************************************
152                      ;*                  BRANCH, OBRANCH                 *
153                      ;****************************************************
154                      ;
155  0116  8642  A               HEAD     ORD,6,LONG,'B'/256
156  0117  5241  A               .WORD    'RA','NC','H'+EVEN,EXEC-5
     0118  4E43  A
     0119  C820  A
     011A  010D  A
157  011B  011C  A      BRAN:    .WORD    .+1
158  011C  5E40  A               RCPY     IP,X             ; ADD OFFSET
159  011D  E600  A               ADD      IP,(X)           ;   TO IP
160  011E  19EA  A               JMP      NEXT
161                      ;
162  011F  8730  A               HEAD     ORD,7,LONG,'0'/256
163  0120  4252  A               .WORD    'BR','AN','CH'+ODD,BRAN-5
     0121  414E  A
     0122  43C8  A
```

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```
     0123  0116  A
164  0124  0125  A      ZBRAN:   .WORD    .+1
165  0125  C300  A               LD       0,0(SP)          ; GET BOOLEAN
166  0126  7B01  A               AISZ     SP,1             ; POP STACK
167  0127  41F4  A               BOC      Z,BRAN+1         ; IF BOOLEAN = 0
168  0128  7901  A               AISZ     IP,1             ; STEP IP OVER OFFSET
169  0129  19DF  A               JMP      NEXT
170                      ;
171                      ;****************************************************
172                      ;*                  LOOP CONTROL                    *
173                      ;****************************************************
174                      ;
175  012A  8628  A               HEAD     ORD,6,LONG,'('/256
176  012B  4C4F  A               .WORD    'LO','OP',')'+EVEN,ZBRAN-5
     012C  4F50  A
     012D  A920  A
     012E  011F  A
177  012F  0130  A      XLOOP:   .WORD    .+1
178  0130  5001  A               LI       0,1              ; INCREMENT = 1
179  0131  C821  A               LD       X,RP             ; GET RETURN POINTER
180  0132  E200  A               ADD      0,(X)            ; UPDATE
181  0133  D200  A               ST       0,(X)            ;   INDEX
182  0134  3780  A               SFLG     CRY              ; SUBTRACT
183  0135  9201  A               SUBB     0,1(X)           ;   LIMIT
184  0136  4BE5  A               BOC      M,BRAN+1         ; IF LIMIT > INDEX
185  0137  7901  A      XLOOP1:  AISZ     IP,1             ; STEP IP OVER OFFSET
186  0138  7A02  A               AISZ     X,2              ; POP INDEX AND LIMIT
187  0139  D821  A               ST       X,RP             ;   FROM RETURN STACK
188  013A  19CE  A               JMP      NEXT
```

```
189                    ;
190 013B 8728 A                  HEAD    ORD,7,LONG,'('/256
191 013C 2B4C A                  .WORD   '+L','OO','P)'+ODD,XLOOP-5
    013D 4F4F A
    013E 50A9 A
    013F 012A A
192 0140 0141 A        XPLOOP: .WORD    .+1
193 0141 6100 A                  PUSH    IP              ; SAVE IP
194 0142 C700 A                  LD      1,0(SP)         ; GET INCREMENT
195 0143 7B01 A                  AISZ    SP,1            ; POP STACK
196 0144 C821 A                  LD      X,RP            ; GET RETURN POINTER
197 0145 C200 A                  LD      0,(X)           ; GET INDEX
198 0146 6840 A                  RADD    1,0             ; ADD INCREMENT
199 0147 D200 A                  ST      0,(X)           ; UPDATE INDEX
200 0148 3780 A                  SFLG    CRY             ; SUBTRACT
201 0149 9201 A                  SUBB    0,1(X)          ;   LOOP LIMIT
202 014A 4104 A                  BOC     Z,PULL          ; IF INDEX = LIMIT
203 014B 5840 A                  RXOR    1,0             ; COMBINE SIGN BITS
204 014C 6500 A                  PULL    IP              ; RESTORE IP
205 014D 4BCE A                  BOC     M,BRAN+1        ; IND<LIM XOR INC<0
206 014E 19E8 A                  JMP     XLOOP1
207 014F 6500 A        PULL:   PULL    IP              ; RESTORE IP
208 0150 19E6 A                  JMP     XLOOP1
209                    ;
210                    ;***********************************************
211                    ;*            (DO), POPTWO, POP, I              *
```

```
212                    ;***********************************************
213                    ;
214 0151 8428 A                  HEAD    ORD,4,LONG,'('/256
215 0152 444F A                  .WORD   'DO',')'+EVEN,XPLOOP-5
    0153 A920 A
    0154 013B A
216 0155 0156 A        XDO:    .WORD    .+1
217 0156 C301 A                  LD      0,1(SP)         ; MOVE LIMIT
218 0157 AC21 A                  DSZ     RP              ;   TO RETURN
219 0158 B021 A                  ST      0,@RP           ;     STACK
220 0159 C300 A                  LD      0,0(SP)         ; MOVE INITIAL
221 015A AC21 A                  DSZ     RP              ;   INDEX TO RETURN
222 015B B021 A                  ST      0,@RP           ;     STACK
223 015C 7B01 A        POP2:   AISZ    SP,1            ; POP ONE ITEM
224 015D 7B01 A        POP:    AISZ    SP,1            ; POP ONE ITEM
225 015E 19AA A                  JMP     NEXT
226                    ;
227 015F 81C9 A                  HEAD    ORD,1,SHORT,'I'/256
228 0160 0151 A                  .WORD   XDO-4
229 0161 028A A        I:      .WORD    R+1             ; GET FROM RTN STACK
230                    ;
```

```
231                  ;****************************************************
232                  ;*                          DIGIT                                *
233                  ;****************************************************
234                  ;
235  0162 8544 A              HEAD     ORD,5,LONG,'D'/256
236  0163 4947 A              .WORD    'IG','IT'+ODD,I-2
     0164 49D4 A
     0165 015F A
237  0166 0167 A     DIGIT:   .WORD    .+1
238  0167 C301 A              LD       0,1(SP)              ; GET ASCII
239  0168 78D0 A              AISZ     0,-0030
240  0169 4B0B A              BOC      M,BAD                ; ASCII < 30
241  016A 9D0C A              SKG      0,NINE
242  016B 1903 A              JMP      CKBASE               ; 30 <= ASCII <= 39
243  016C 78F9 A              AISZ     0,-7
244  016D 9D09 A              SKG      0,NINE
245  016E 1906 A              JMP      BAD                  ; 39 < ASCII < 41
246  016F 9F00 A     CKBASE:  SKG      0,0(SP)
247  0170 F300 A              SKNE     0,0(SP)
248  0171 1903 A              JMP      BAD                  ; ASCII >= BASE
249  0172 D301 A              ST       0,1(SP)              ; PUT DIGIT SECOND
250  0173 5001 A              LI       0,1                  ;  AND TRUE FLAG
251  0174 1993 A              JMP      PUT                  ;   ON BOTTOM
252  0175 5000 A     BAD:     LI       0,0                  ; LEAVE FALSE FLAG
253  0176 98F6 I              JMP      BIN                  ;   ON BOTTOM
254  0177 0009 A     NINE:    .WORD    9
255                  ;
256                  ;****************************************************
257                  ;*                          (FIND)                              *
258                  ;****************************************************
259                  ;
260  0178 8628 A              HEAD     ORD,6,LONG,'('/256
261  0179 4649 A              .WORD    'FI','ND',')'+EVEN,DIGIT-4
     017A 4E44 A
```

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```
     017B A920 A
     017C 0162 A
262  017D 017E A     PFIND:   .WORD    .+1
263  017E 6100 A              PUSH     IP                   ; SAVE IP
264  017F 7BFF A              AISZ     SP,-1                ; EXTEND STACK
265  0180 CB01 A              LD       X,1(SP)              ; GET NFA
266  0181 A302 A     NEWNAM:  LD       0,@2(SP)             ; FIRST WD OF STRING
267  0182 C600 A              LD       1,(X)                ; FIRST WD OF NAME
268  0183 5840 A              RXOR     1,0
269  0184 A923 A              AND      0,X3FFF              ; CLEAR START & PREC
270  0185 B923 A              SKAZ     0,X7F7F              ; CMP LTH, FIRST CHAR
271  0186 1915 A              JMP      MISS                 ; IF MISMATCH
272  0187 450C A              BOC      NZ,FOUND             ; IF ONLY ONE CHAR
273  0188 C702 A              LD       1,2(SP)              ; INITIALIZE
274  0189 D700 A              ST       1,0(SP)              ;  STRING POINTER
275  018A 7A01 A     CYCLE:   AISZ     X,1                  ; BUMP NAME AND
276  018B 8F00 A              ISZ      0(SP)                ;  STRING POINTERS
```

```
277 018C A300 A              LD     0,@0(SP)        ; NEXT WD OF STRING
278 018D C600 A              LD     1,(X)           ; NEXT WD OF NAME
279 018E 5840 A              RXOR   1,0
280 018F 4201 A              BOC    P,.+2           ; IF HI BYTE IS LAST,
281 0190 A919 A              AND    0,XFF00         ;   CLEAR LOW BYTE
282 0191 B917 A              SKAZ   0,X7F7F         ; COMPARE CHARS
283 0192 1909 A              JMP    MISS            ; IF MISMATCH
284 0193 41F6 A              BOC    Z,CYCLE         ; IF NO STOP BIT
285 0194 7A03 A      FOUND:  AISZ   X,3             ; FORM PFA
286 0195 DB02 A              ST     X,2(SP)         ; PUT THIRD ON STACK
287 0196 A301 A              LD     0,@1(SP)        ; FIRST WD OF NAME
288 0197 2C10 A              SHR    0,8,0           ; GET LENGTH BYTE
289 0198 D301 A              ST     0,1(SP)         ; PUT SECOND ON STACK
290 0199 5001 A              LI     0,1             ; BOOLEAN TRUE
291 019A 6500 A              PULL   IP              ; RESTORE IP
292 019B 98F7 I              JMP    PUT             ; BOOLEAN ON BOTTOM
293 019C B90E A      MISS:   SKAZ   0,X8080         ; TEST FOR A STOP BIT
294 019D 1903 A              JMP    ENDNAM          ; IF PRESENT
295 019E 7A01 A              AISZ   X,1             ; BUMP NAME POINTER
296 019F C200 A              LD     0,(X)           ; GET NEXT WORD
297 01A0 19FB A              JMP    MISS            ; CONTINUE SCANNING
298 01A1 CA01 A      ENDNAM: LD     X,1(X)          ; FETCH LINK
299 01A2 DB01 A              ST     X,1(SP)         ; NEW NFA
300 01A3 7A00 A              AISZ   X,0             ; TEST FOR LINK = 0
301 01A4 19DC A              JMP    NEWNAM          ; IF NOT DONE
302 01A5 DB02 A              ST     X,2(SP)         ; PUT BOOLEAN FALSE
303 01A6 6500 A              PULL   IP              ; RESTORE IP
304 01A7 19B4 A              JMP    POP2
305                  ;
306 01A8 3FFF A      X3FFF:  .WORD  03FFF
307 01A9 7F7F A      X7F7F:  .WORD  07F7F
308 01AA FF00 A      XFF00:  .WORD  0FF00
309 01AB 8080 A      X8080:  .WORD  08080
310                  ;
311                  ;***********************************************
312                  ;*                   ENCLOSE                   *
313                  ;***********************************************
314                  ;
```

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```
315                  ;   SCAN SOURCE STRING, PACKED TWO CHARACTERS/WORD,
316                  ;     FOR DELIMITER ON TOP OF STACK, OR ASCII NULL.
317                  ;
318 01AC 8745 A              HEAD   ORD,7,LONG,'E'/256
319 01AD 4E43 A              .WORD  'NC','LO','SE'+ODD,PFIND-5
    01AE 4C4F A
    01AF 53C5 A
    01B0 0178 A
320 01B1 01B2 A      ENCL:   .WORD  .+1
321 01B2 6100 A              PUSH   IP              ; SAVE IP
322 01B3 7BFE A              AISZ   SP,-2           ; EXTEND STACK
323 01B4 C302 A              LD     0,2(SP)         ; GET DELIMITER
324 01B5 A932 A              AND    0,RMASK         ; USE LOWER
325 01B6 5D00 A              RCPY   0,1             ;  BYTE ONLY
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```
326  01B7  2910  A              SHL      1,8,0          ; DOUBLE UP
327  01B8  6900  A              RADD     0,1            ;   DELIMITER
328  01B9  C303  A              LD       0,3(SP)        ; GET BYTE ADDRESS
329  01BA  3800  A              PFLG     LINK
330  01BB  2403  A              ROR      0,1,1          ; CONVERT ADDRESS
331  01BC  D300  A              ST       0,0(SP)        ; SAVE WORD ADDRESS
332  01BD  5200  A              LI       X,0            ; CLEAR COUNT
333  01BE  A300  A     NEW1:    LD       0,@0(SP)       ; GET NEXT 2 BYTES
334  01BF  5840  A              RXOR     1,0            ; COMPARE WITH DELIMS
335  01C0  4803  A              BOC      LINK,RT1       ; IF START ADDR ODD
336  01C1  B925  A              SKAZ     0,LMASK        ; TEST LEFT BYTE
337  01C2  1908  A              JMP      LNDEL          ; IF NOT DELIM
338  01C3  7A01  A              AISZ     X,1            ; BUMP COUNT
339  01C4  B923  A     RT1:     SKAZ     0,RMASK        ; TEST RIGHT BYTE
340  01C5  1904  A              JMP      RNDEL          ; IF NOT DELIM
341  01C6  7A01  A              AISZ     X,1            ; BUMP COUNT
342  01C7  3800  A              PFLG     LINK           ; LEFT BYTE OF
343  01C8  8F00  A              ISZ      0(SP)          ;   FOLLOWING WORD
344  01C9  19F4  A              JMP      NEW1           ;    IS NEXT
345  01CA  3880  A     RNDEL:   SFLG     LINK           ; REMEMBER WHICH BYTE
346  01CB  DB02  A     LNDEL:   ST       X,2(SP)        ; SET FC OFFSET
347  01CC  4810  A              BOC      LINK,RT2       ; RESUME AT SAME BYTE
348  01CD  A300  A     NEW2:    LD       0,@0(SP)       ; GET DATA
349  01CE  DB01  A              ST       X,1(SP)        ; MAYBE EW OFFSET
350  01CF  B917  A              SKAZ     0,LMASK        ; TEST FOR NULL
351  01D0  1905  A              JMP      NONUL
352  01D1  DB00  A     NUL:     ST       X,0(SP)        ; NC OFFSET
353  01D2  FB02  A              SKNE     X,2(SP)        ; IS NC = FC?
354  01D3  8F01  A              ISZ      1(SP)          ; YES, BUMP EW
355  01D4  6500  A              PULL     IP             ; RESTORE IP
356  01D5  98F8  I              JMP      NEXT
357  01D6  7A01  A     NONUL:   AISZ     X,1            ; BUMP COUNT
358  01D7  5840  A              RXOR     1,0
359  01D8  B90E  A              SKAZ     0,LMASK        ; TEST FOR DELIM
360  01D9  1903  A              JMP      RT2
361  01DA  DB00  A     DELIM:   ST       X,0(SP)        ; NC OFFSET
362  01DB  6500  A              PULL     IP             ; RESTORE IP
363  01DC  98F8  I              JMP      NEXT
364  01DD  5840  A     RT2:     RXOR     1,0
365  01DE  DB01  A              ST       X,1(SP)        ; MAYBE EW
366  01DF  A908  A              AND      0,RMASK
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```
367  01E0  41F0  A              BOC      Z,NUL          ; TEST FOR NULL
368  01E1  7A01  A              AISZ     X,1            ; BUMP COUNT
369  01E2  5840  A              RXOR     1,0
370  01E3  A904  A              AND      0,RMASK
371  01E4  41F5  A              BOC      Z,DELIM        ; TEST FOR DELIM
372  01E5  8F00  A              ISZ      0(SP)          ; BACK FOR
373  01E6  19E6  A              JMP      NEW2           ;   NEXT WORD
374  01E7  FF00  A     LMASK:   .WORD    0FF00
375  01E8  00FF  A     RMASK:   .WORD    000FF
376                             ;
```

```
377                    ;*****************************************************
378                    ;*                    TERMINAL VECTORS               *
379                    ;*****************************************************
380                    ;
381                    ; THESE WORDS VECTOR TO INSTALLATION-SPECIFIC CODE
382                    ;
383 01E9 8445 A                HEAD    ORD,4,LONG,'E'/256
384 01EA 4D49 A                .WORD   'MI','T'+EVEN,ENCL-5
    01EB D420 A
    01EC 01AC A
385 01ED 0A49 A        EMIT:   .WORD   PEMIT
386                    ;
387 01EE 834B A                HEAD    ORD,3,LONG,'K'/256
388 01EF 45D9 A                .WORD   'EY'+ODD,EMIT-4
    01F0 01E9 A
389 01F1 0A4D A        KEY:    .WORD   PKEY
390                    ;
391 01F2 893F A                HEAD    ORD,9,LONG,'?'/256
392 01F3 5445 A                .WORD   'TE','RM','IN','AL'+ODD,KEY-3
    01F4 524D A
    01F5 494E A
    01F6 41CC A
    01F7 01EE A
393 01F8 0A4F A        QTERM:  .WORD   PQTERM
394                    ;
395 01F9 8243 A                HEAD    ORD,2,LONG,'C'/256
396 01FA D220 A                .WORD   'R'+EVEN,QTERM-6
    01FB 01F2 A
397 01FC 0A53 A        CR:     .WORD   PCR
398                    ;
399                    ;*****************************************************
400                    ;*                         MOVE                      *
401                    ;*****************************************************
402                    ;
403                    ;  NOTE THAT THIS WORD MOVES DATA IN 16-BIT UNITS.
404                    ;
405 01FD 844D A                HEAD    ORD,4,LONG,'M'/256
406 01FE 4F56 A                .WORD   'OV','E'+EVEN,CR-3
    01FF C520 A
    0200 01F9 A
407 0201 0202 A        MOVE:   .WORD   .+1
408 0202 C300 A                LD      0,0(SP)         ; GET COUNT
409 0203 410A A                BOC     Z,MOVE2         ; IF ZERO
410 0204 6100 A                PUSH    IP              ; SAVE IP
411 0205 5D00 A                RCPY    0,1
```

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```
412 0206 CB02 A                LD      X,2(SP)         ; SOURCE ADDRESS
413 0207 C200 A        MOVE1:  LD      0,(X)           ; GET DATA ITEM
414 0208 B301 A                ST      0,@1(SP)        ; STORE AT DEST
415 0209 7A01 A                AISZ    X,1             ; INCREMENT
416 020A 8F01 A                ISZ     1(SP)           ;  ADDRESSES
417 020B 79FF A                AISZ    1,-1            ; DECREMENT COUNT
418 020C 19FA A                JMP     MOVE1           ; UNTIL DONE
```

```
419  020D 6500 A            PULL    IP              ; RESTORE IP
420  020E 7B03 A    MOVE2:  AISZ    SP,3            ; POP ARGUMENTS
421  020F 98F8 I            JMP     NEXT
422                 ;
423                 ;***************************************************
424                 ;*              U*, FOR 16 BITS                    *
425                 ;***************************************************
426                 ;
427  0210 8255 A            HEAD    ORD,2,LONG,'U'/256
428  0211 AA20 A            .WORD   '*'+EVEN,MOVE-4
     0212 01FD A
429  0213 0214 A    USTAR:  .WORD   .+1
430  0214 6100 A            PUSH    IP              ; SAVE IP
431  0215 C300 A            LD      0,0(SP)         ; GET MULTIPLIER
432  0216 5100 A            LI      1,0             ; CLEAR RESULT
433  0217 5210 A            LI      X,16            ; LOOP COUNT
434  0218 7000 A            CAI     0,0             ; COMPLEMENT MPLR
435  0219 6940 A    LP:     RADD    1,1             ; SHIFT LO INTO CRY
436  021A 7400 A            RADC    0,0             ; ROTATE MPLR LEFT
437  021B 4A02 A            BOC     CSET, TEST      ; TEST FOR ADD
438  021C E701 A            ADD     1,1(SP)         ; ADD IF MPLR BIT=1
439  021D 9105 A            SUBB    0, MINUS1       ; ADD CARRY TO HI
440  021E 7AFF A    TEST:   AISZ    X,-1            ; DECR LOOP COUNT
441  021F 19F9 A            JMP     LP              ; REPEAT UNTIL LIMIT
442  0220 D701 A            ST      1,1(SP)         ; PUT LO-ORDER SECOND
443  0221 6500 A            PULL    IP              ; RESTORE IP
444  0222 98F7 I            JMP     PUT             ; HI-ORDER ON BOTTOM
445  0223 FFFF A    MINUS1: .WORD   -1
446                 ;
447                 ;***************************************************
448                 ;*              U/, FOR 32 BITS                    *
449                 ;***************************************************
450                 ;
451  0224 8255 A            HEAD    ORD,2,LONG,'U'/256
452  0225 AF20 A            .WORD   '/'+EVEN,USTAR-3
     0226 0210 A
453  0227 0228 A    USLASH: .WORD   .+1
454  0228 6100 A            PUSH    IP              ; SAVE IP
455  0229 C701 A            LD      1,1(SP)         ; HI-ORDER DIVIDEND
456  022A C302 A            LD      0,2(SP)         ; LO-ORDER DIVIDEND
457  022B CB00 A            LD      X,0(SP)         ; GET DIVISOR
458  022C 7201 A            CAI     X,1             ; SAVE -(DIVISOR) FOR
459  022D DB01 A            ST      X,1(SP)         ;  CONVENIENCE
460  022E 5210 A            LI      X,16            ; LOOP COUNT
461  022F 2803 A            SHL     0,1,1           ; SHIFT LO INTO LINK
462  0230 2103 A    POOL:   ROL     1,1,1           ; ROTATE HI WITH LINK
463  0231 2003 A            ROL     0,1,1           ; ROTATE HI INTO QUOT
464  0232 E701 A            ADD     1,1(SP)         ; SUBTR DIVSR FROM HI
```

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```
465  0233 9107 A            SUBB    0,MIN1          ; ADD CARRY TO QUOT
466  0234 4301 A            BOC     BIT0,.+2        ; IF QUOT BIT = 0,
467  0235 E700 A            ADD     1,0(SP)         ;  ADD DIVISOR BACK
```

```
468 0236 7AFF A                AISZ    X,-1            ; DECREMENT LOOP CNT
469 0237 19F8 A                JMP     POOL            ; REPEAT UNTIL LIMIT
470 0238 D702 A                ST      1,2(SP)         ; REMAINDER SECOND
471 0239 6500 A                PULL    IP              ; RESTORE IP
472 023A 1967 A                JMP     BIN             ; QUOTIENT ON BOTTOM
473 023B FFFF A        MIN1:   .WORD   -1
474                    ;
475                    ;*************************************************
476                    ;*                   LOGICALS                    *
477                    ;*************************************************
478                    ;
479 023C 8341 A                HEAD    ORD,3,LONG,'A'/256
480 023D 4EC4 A                .WORD   'ND'+ODD,USLASH-3
    023E 0224 A
481 023F 0240 A        AND:    .WORD   .+1
482 0240 C301 A                LD      0,1(SP)         ; GET SECOND
483 0241 AB00 A                AND     0,0(SP)         ;  AND WITH BOTTOM
484 0242 195F A                JMP     BIN             ; REMOVE ARGS
485                    ;
486 0243 824F A                HEAD    ORD,2,LONG,'O'/256
487 0244 D220 A                .WORD   'R'+EVEN,AND-3
    0245 023C A
488 0246 0247 A        OR:     .WORD   .+1
489 0247 C301 A                LD      0,1(SP)         ; GET SECOND
490 0248 A700 A                OR      0,0(SP)         ;  OR WITH BOTTOM
491 0249 1958 A                JMP     BIN             ; REMOVE ARGS
492                    ;
493 024A 8358 A                HEAD    ORD,3,LONG,'X'/256
494 024B 4FD2 A                .WORD   'OR'+ODD,OR-3
    024C 0243 A
495 024D 024E A        XOR:    .WORD   .+1
496 024E C301 A                LD      0,1(SP)         ; GET SECOND
497 024F CB00 A                LD      X,0(SP)         ; GET BOTTOM
498 0250 5880 A                RXOR    X,0             ; FORM EXCLUSIVE OR
499 0251 1950 A                JMP     BIN             ; REMOVE ARGS
500                    ;
501                    ;*************************************************
502                    ;*            STACK INITIALIZATION               *
503                    ;*************************************************
504                    ;
505 0252 8353 A                HEAD    ORD,3,LONG,'S'/256
506 0253 50C0 A                .WORD   'P@'+ODD,XOR-3
    0254 024A A
507 0255 0256 A        SPAT:   .WORD   .+1
508 0256 5CC0 A                RCPY    SP,0            ; STACK POINTER
509 0257 98F9 I                JMP     PUSH            ; PUSH ON STACK
510                    ;
511 0258 8353 A                HEAD    ORD,3,LONG,'S'/256
512 0259 50A1 A                .WORD   'P!'+ODD,SPAT-3
    025A 0252 A
513 025B 025C A        SPSTOR: .WORD   .+1
514 025C C822 A                LD      X,UP            ; GET USER POINTER
```

```
515 025D CE03 A                LD      SP,3(X)            ; FETCH SP0
516 025E 98F8 I                JMP     NEXT
517                   ;
518 025F 8352 A                HEAD    ORD,3,LONG,'R'/256
519 0260 50A1 A                .WORD   'P!'+ODD,SPSTOR-3
    0261 0258 A
520 0262 0263 A      RPSTOR:   .WORD   .+1
521 0263 C822 A                LD      X,UP               ; GET USER POINTER
522 0264 C204 A                LD      0,4(X)             ; FETCH R0
523 0265 D021 A                ST      0,RP               ; SET RETURN POINTER
524 0266 98F8 I                JMP     NEXT
525                   ;
526 0267 823B A                HEAD    ORD,2,LONG,';'/256
527 0268 D320 A                .WORD   'S'+EVEN,RPSTOR-3
    0269 025F A
528 026A 026B A      SEMIS:    .WORD   .+1
529 026B A021 A                LD      0,@RP              ; RESTORE
530 026C 5D00 A                RCPY    0,IP               ;   OLD IP
531 026D 8C21 A                ISZ     RP                 ; POP RETURN STACK
532 026E 98F8 I                JMP     NEXT
533                   ;
534                   ;************************************************
535                   ;*              RETURN STACK WORDS              *
536                   ;************************************************
537                   ;
538 026F 854C A                HEAD    ORD,5,LONG,'L'/256
539 0270 4541 A                .WORD   'EA','VE'+ODD,SEMIS-3
    0271 56C5 A
    0272 0267 A
540 0273 0274 A      LEAVE:    .WORD   .+1
541 0274 C821 A                LD      X,RP               ; GET RETURN POINTER
542 0275 C200 A                LD      0,0(X)             ; GET LOOP INDEX
543 0276 D201 A                ST      0,1(X)             ; MAKE LIMIT EQUAL
544 0277 98F8 I                JMP     NEXT
545                   ;
546 0278 823E A                HEAD    ORD,2,LONG,'>'/256
547 0279 D220 A                .WORD   'R'+EVEN,LEAVE-4
    027A 026F A
548 027B 027C A      TOR:      .WORD   .+1
549 027C AC21 A                DSZ     RP                 ; EXTEND RETURN STACK
550 027D C300 A                LD      0,(SP)             ; GET DATA ITEM
551 027E B021 A                ST      0,@RP              ; PUT ON RETURN STACK
552 027F 98FA I                JMP     POP                ; POP FROM DATA STACK
553                   ;
554 0280 8252 A                HEAD    ORD,2,LONG,'R'/256
555 0281 BE20 A                .WORD   '>'+EVEN,TOR-3
    0282 0278 A
556 0283 0284 A      FROMR:    .WORD   .+1
557 0284 A021 A                LD      0,@RP              ; GET FROM RETURN STK
558 0285 8C21 A                ISZ     RP                 ; POP RETURN STACK
559 0286 98F9 I                JMP     PUSH               ; PUSH ON DATA STACK
560                   ;
561 0287 81D2 A                HEAD    ORD,1,SHORT,'R'/256
562 0288 0280 A                .WORD   FROMR-3
563 0289 028A A      R:        .WORD   .+1
```

```
564 028A A021 A              LD      0,@RP          ; GET NONDESTRUCTIVE
565 028B 98F9 I              JMP     PUSH           ; PUSH ON DATA STACK
566                  ;
567                  ;*****************************************************
568                  ;*              TESTS AND LOGICALS                  *
569                  ;*****************************************************
570                  ;
571 028C 8230 A              HEAD    ORD,2,LONG,'0'/256
572 028D BD20 A              .WORD   '='+EVEN,R-2
    028E 0287 A
573 028F 0290 A  ZEQU:       .WORD   .+1
574 0290 5000 A              LI      0,0            ; RETURN ZERO
575 0291 F300 A              SKNE    0,0(SP)        ;   IF DATA NONZERO
576 0292 5001 A              LI      0,1            ; OTHERWISE RETURN 1
577 0293 98F7 I              JMP     PUT
578                  ;
579 0294 8230 A              HEAD    ORD,2,LONG,'0'/256
580 0295 BC20 A              .WORD   '<'+EVEN,ZEQU-3
    0296 028C A
581 0297 0298 A  ZLESS:      .WORD   .+1
582 0298 5000 A              LI      0,0            ; RETURN ZERO
583 0299 9F00 A              SKG     0,0(SP)        ;   IF DATA <= ZERO
584 029A 98F7 I              JMP     PUT
585 029B 5001 A              LI      0,1            ; OTHERWISE RETURN 1
586 029C 98F7 I              JMP     PUT
587                  ;
588                  ;*****************************************************
589                  ;*                 MATH, BINARY                     *
590                  ;*****************************************************
591                  ;
592 029D 81AB A              HEAD    ORD,1,SHORT,'+'/256
593 029E 0294 A              .WORD   ZLESS-3
594 029F 02A0 A  PLUS:       .WORD   .+1
595 02A0 C300 A              LD      0,0(SP)        ; ADD BOTTOM TWO
596 02A1 E301 A              ADD     0,1(SP)        ;   STACK VALUES
597 02A2 7B01 A  BIN:        AISZ    SP,1           ; REMOVE ONE ARG
598 02A3 98F7 I              JMP     PUT            ; REPL OTHER W/RESULT
599                  ;
600 02A4 8244 A              HEAD    ORD,2,LONG,'D'/256
601 02A5 AB20 A              .WORD   '+'+EVEN,PLUS-2
    02A6 029D A
602 02A7 02A8 A  DPLUS:      .WORD   .+1
603 02A8 C303 A              LD      0,3(SP)        ; AUGEND LOW-ORDER
604 02A9 E301 A              ADD     0,1(SP)        ; ADDEND LOW-ORDER
605 02AA D303 A              ST      0,3(SP)        ; SUM LOW-ORDER
606 02AB C302 A              LD      0,2(SP)        ; AUGEND HI-ORDER
607 02AC CB00 A              LD      X,0(SP)        ; ADDEND HI-ORDER
608 02AD 7480 A              RADC    X,0            ; ADD WITH CARRY
609 02AE D302 A              ST      0,2(SP)        ; SUM HI-ORDER
610 02AF 98FB I              JMP     POP2
611                  ;
612 02B0 854D A              HEAD    ORD,5,LONG,'M'/256
613 02B1 494E A              .WORD   'IN','US'+ODD,DPLUS-3
    02B2 55D3 A
    02B3 02A4 A
```

```
 614  02B4  02B5  A    MINUS:   .WORD    .+1
 615  02B5  C300  A             LD       0,(SP)            ; GET STACK VALUE
 616  02B6  7001  A             CAI      0,1               ;   AND FORM 2'S COMP
 617  02B7  98F7  I             JMP      PUT
 618                        ;
 619  02B8  8644  A             HEAD     ORD,6,LONG,'D'/256
 620  02B9  4D49  A             .WORD    'MI','NU','S'+EVEN,MINUS-4
      02BA  4E55  A
      02BB  D320  A
      02BC  02B0  A
 621  02BD  02BE  A    DMINUS:  .WORD    .+1
 622  02BE  3780  A             SFLG     CRY               ; CLEAR BORROW
 623  02BF  5000  A             LI       0,0               ; SUBTRACT LO-ORDER
 624  02C0  9301  A             SUBB     0,1(SP)           ;  FROM 0
 625  02C1  D301  A             ST       0,1(SP)
 626  02C2  5000  A             LI       0,0               ; SUBTRACT HI-ORDER
 627  02C3  9300  A             SUBB     0,0(SP)           ;  FROM 0 WITH BORROW
 628  02C4  98F7  I             JMP      PUT
 629                        ;
 630                        ;*********************************************************
 631                        ;*                   STACK MANIPULATION                  *
 632                        ;*********************************************************
 633                        ;
 634  02C5  844F  A             HEAD     ORD,4,LONG,'O'/256
 635  02C6  5645  A             .WORD    'VE','R'+EVEN,DMINUS-5
      02C7  D220  A
      02C8  02B8  A
 636  02C9  02CA  A    OVER:    .WORD    .+1
 637  02CA  C301  A             LD       0,1(SP)           ; GET SECOND VALUE
 638  02CB  98F9  I             JMP      PUSH              ; PUSH ON STACK
 639                        ;
 640  02CC  8444  A             HEAD     ORD,4,LONG,'D'/256
 641  02CD  524F  A             .WORD    'RO','P'+EVEN,OVER-4
      02CE  D020  A
      02CF  02C5  A
 642  02D0  015D  A    DROP:    .WORD    POP               ; VECTOR DIRECTLY
 643                        ;
 644  02D1  8453  A             HEAD     ORD,4,LONG,'S'/256
 645  02D2  5741  A             .WORD    'WA','P'+EVEN,DROP-4
      02D3  D020  A
      02D4  02CC  A
 646  02D5  02D6  A    SWAP:    .WORD    .+1
 647  02D6  C301  A             LD       0,1(SP)           ; EXCHANGE TOP
 648  02D7  CB00  A             LD       X,0(SP)           ;  TWO STACK
 649  02D8  DB01  A             ST       X,1(SP)           ;   VALUES
 650  02D9  98F7  I             JMP      PUT
 651                        ;
 652  02DA  8344  A             HEAD     ORD,3,LONG,'D'/256
 653  02DB  55D0  A             .WORD    'UP'+ODD,SWAP-4
      02DC  02D1  A
 654  02DD  02DE  A    DUP:     .WORD    .+1
 655  02DE  C300  A             LD       0,0(SP)           ; GET BOTTOM VALUE
 656  02DF  98F9  I             JMP      PUSH              ; PUSH A COPY OF IT
 657                        ;
```

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```
659                    ;*  MEMORY INCREMENT, COMPLEMENT, ADDRESS CONVERT  *
660                    ;*********************************************
661                    ;
662 02E0  822B  A              HEAD     ORD,2,LONG,'+'/256
663 02E1  A120  A              .WORD    '!'+EVEN,DUP-3
    02E2  02DA  A
664 02E3  02E4  A      PSTORE:  .WORD    .+1
665 02E4  A300  A               LD      0,@0(SP)          ; GET VALUE
666 02E5  E301  A               ADD     0,1(SP)           ; ADD INCREMENT
667 02E6  B300  A               ST      0,@0(SP)          ; STORE AT ADDRESS
668 02E7  98FB  I               JMP     POP2              ; REMOVE BOTH
669                    ;
670                    ;  THE FOLLOWING WORD EXPECTS A BYTE PSEUDO-ADDRESS
671                    ;
672 02E8  8654  A              HEAD     ORD,6,LONG,'T'/256
673 02E9  4F47  A              .WORD    'OG','GL','E'+EVEN,PSTORE-3
    02EA  474C  A
    02EB  C520  A
    02EC  02E0  A
674 02ED  02EE  A      TOGGLE:  .WORD    .+1
675 02EE  CB01  A               LD      X,1(SP)           ; GET BYTE ADDRESS
676 02EF  3800  A               PFLG    LINK              ; CONVERT TO
677 02F0  2603  A               ROR     X,1,1             ;  WORD ADDRESS
678 02F1  DB01  A               ST      X,1(SP)           ; SAVE FOR LATER
679 02F2  C200  A               LD      0,(X)             ; GET DATA WORD
680 02F3  CB00  A               LD      X,0(SP)           ; GET BIT PATTERN
681 02F4  4801  A               BOC     LINK,.+2          ; EVEN BYTE ADDRESS
682 02F5  2A10  A               SHL     X,8,0             ;  MEANS LEFT BYTE
683 02F6  5880  A               RXOR    X,0               ; COMPL SELECTED BITS
684 02F7  B301  A               ST      0,@1(SP)          ; REPLACE DATA WORD
685 02F8  98FB  I               JMP     POP2
686                    ;
687                    ;  THE FOLLOWING WORD CONVERTS A 15-BIT WORD
688                    ;   ADDRESS TO A 16-BIT BYTE PSEUDO-ADDRESS.
689                    ;
690 02F9  8442  A              HEAD     ORD,4,LONG,'B'/256
691 02FA  5954  A              .WORD    'YT','E'+EVEN,TOGGLE-5
    02FB  C520  A
    02FC  02E8  A
692 02FD  02FE  A      BYTE:    .WORD    .+1
693 02FE  C300  A               LD      0,0(SP)           ; GET WORD ADDRESS
694 02FF  6800  A               RADD    0,0               ; MULTIPLY BY 2
695 0300  98F7  I               JMP     PUT
696                    ;
697                    ;  THE FOLLOWING WORD CONVERTS A 16-BIT BYTE
698                    ;   PSEUDO-ADDRESS TO A 15-BIT WORD ADDRESS.
699                    ;
700 0301  8443  A              HEAD     ORD,4,LONG,'C'/256
701 0302  454C  A              .WORD    'EL','L'+EVEN,BYTE-4
    0303  CC20  A
    0304  02F9  A
```

```
702 0305 0306 A   CELL:    .WORD     .+1
703 0306 C300 A            LD        0,0(SP)           ; GET BYTE ADDRESS
704 0307 2C02 A            SHR       0,1,0             ; DIVIDE BY 2
705 0308 98F7 I            JMP       PUT
```

```
706                     ;
707                     ;**********************************************
708                     ;*              MEMORY FETCH AND STORE        *
709                     ;**********************************************
710                     ;
711 0309 81C0 A            HEAD      ORD,1,SHORT,'@'/256
712 030A 0301 A            .WORD     CELL-4
713 030B 030C A   AT:      .WORD     .+1
714 030C A300 A            LD        0,@0(SP)          ; GET VALUE
715 030D 98F7 I            JMP       PUT
716                     ;
717                     ;   THE FOLLOWING WORD EXPECTS A BYTE PSEUDO-ADDRESS
718                     ;
719 030E 8243 A            HEAD      ORD,2,LONG,'C'/256
720 030F C020 A            .WORD     '@'+EVEN,AT-2
    0310 0309 A
721 0311 0312 A   CAT:     .WORD     .+1
722 0312 CB00 A            LD        X,0(SP)           ; GET BYTE ADDRESS
723 0313 3800 A            PFLG      LINK              ; CONVERT TO
724 0314 2603 A            ROR       X,1,1             ;   WORD ADDRESS
725 0315 C200 A            LD        0,(X)             ; GET DATA WORD
726 0316 4801 A            BOC       LINK,.+2          ; LINK = 0 MEANS
727 0317 2C10 A            SHR       0,8,0             ;    LEFT BYTE
728 0318 A901 A            AND       0,XFF             ; CLEAR UNWANTED BYTE
729 0319 98F7 I            JMP       PUT
730 031A 00FF A   XFF:     .WORD     00FF
731                     ;
732 031B 81A1 A            HEAD      ORD,1,SHORT,'!'/256
733 031C 030E A            .WORD     CAT-3
734 031D 031E A   STORE:   .WORD     .+1
735 031E C301 A            LD        0,1(SP)           ; GET VALUE
736 031F B300 A            ST        0,@0(SP)          ; STORE AT ADDRESS
737 0320 98FB I            JMP       POP2              ; REMOVE BOTH
738                     ;
739                     ;   THE FOLLOWING WORD EXPECTS A BYTE PSEUDO-ADRESSS
740                     ;
741 0321 8243 A            HEAD      ORD,2,LONG,'C'/256
742 0322 A120 A            .WORD     '!'+EVEN,STORE-2
    0323 031B A
743 0324 0325 A   CSTORE:  .WORD     .+1
744 0325 6100 A            PUSH      IP                ; SAVE IP
745 0326 CB00 A            LD        X,0(SP)           ; GET BYTE ADDRESS
746 0327 3800 A            PFLG      LINK              ; CONVERT TO
747 0328 2603 A            ROR       X,1,1             ; WORD ADDRESS
748 0329 C10B A            LD        0,X00FF
749 032A C701 A            LD        1,1(SP)           ; BYTE TO BE
750 032B 5500 A            RAND      0,1               ;   STORED
751 032C 7000 A            CAI       0,0               ; SET UP MASK
```

```
752 032D 4802 A              BOC      LINK,.+3               ;  AND CLEAR
753 032E 7000 A              CAI      0,0                    ;  APPROPRIATE
754 032F 2910 A              SHL      1,8,0                  ;  HALF OF WORD
755 0330 AA00 A              AND      0,(X)                  ;  TO STORE INTO
756 0331 6840 A              RADD     1,0                    ; ADD IN BYTE
757 0332 D200 A              ST       0,(X)                  ; STORE ALTERED WORD
758 0333 6500 A              PULL     IP                     ; RESTORE IP
```

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```
759 0334 98FB I              JMP      POP2                   ; REMOVE ARGUMENTS
760 0335 00FF A     XOOFF:   .WORD    00FF
761                 ;
762                 ;***********************************************************
763                 ;*                          :, ;                          *
764                 ;***********************************************************
765                 ;
766 0336 C1BA A              HEAD     IMM,1,SHORT,':'/256
767 0337 0321 A              .WORD    CSTORE-3
768 0338 0342 A     COLON:   .WORD    DOCOL,QEXEC,SCSP,CURR,AT,CONT
    0339 04EF A
    033A 04CC A
    033B 0401 A
    033C 030B A
    033D 03FA A
769 033E 031D A              .WORD    STORE,CREATE,RBRAC,PSCODE
    033F 0779 A
    0340 0533 A
    0341 055E A
770                 ;
771 0342 AC21 A     DOCOL:   DSZ      RP                     ; EXTEND RETURN STK
772 0343 5C40 A              RCPY     IP,0                   ; SAVE IP ON
773 0344 B021 A              ST       0,@RP                  ; RETURN STACK
774 0345 5101 A              LI       IP,1                   ; POINT IP TO WORD
775 0346 6980 A              RADD     W,IP                   ;  AFTER DOCOL
776 0347 98F8 I              JMP      NEXT
777                 ;
778 0348 C1BB A              HEAD     IMM,1,SHORT,';'/256
779 0349 0336 A              .WORD    COLON-2
780 034A 0342 A     SEMI:    .WORD    DOCOL,QCSP,COMPIL,SEMIS
    034B 0505 A
    034C 0521 A
    034D 026A A
781 034E 053E A              .WORD    SMUDGE,LBRAC,SEMIS
    034F 052C A
    0350 026A A
```

```
782                   ;
783                   ;*********************************************
784                   ;*              CONSTANT, VARIABLE, USER     *
785                   ;*********************************************
786                   ;
787 0351 8843 A              HEAD    ORD,8,LONG,'C'/256
788 0352 4F4E A              .WORD   'ON','ST','AN','T'+EVEN,SEMI-2
    0353 5354 A
    0354 414E A
    0355 D420 A
    0356 0348 A
789 0357 0342 A     CON:     .WORD   DOCOL,CREATE,SMUDGE,COMMA,PSCODE
    0358 0779 A
    0359 053E A
    035A 0448 A
    035B 055E A
790                   ;
791 035C C201 A     DOCON:   LD      0,1(W)              ; GET PARAMETER
792 035D 98F9 I              JMP     PUSH                ; PUSH ON STACK


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793                   ;
794 035E 8856 A              HEAD    ORD,8,LONG,'V'/256
795 035F 4152 A              .WORD   'AR','IA','BL','E'+EVEN,CON-6
    0360 4941 A
    0361 424C A
    0362 C520 A
    0363 0351 A
796 0364 0342 A     VAR:     .WORD   DOCOL,CON,PSCODE
    0365 0357 A
    0366 055E A
797                   ;
798 0367 5001 A     DOVAR:   LI      0,1                 ; FORM ADDRESS
799 0368 6880 A              RADD    W,0                 ;  OF PARAMETER
800 0369 98F9 I              JMP     PUSH                ; PUSH ON STACK
801                   ;
802 036A 8455 A              HEAD    ORD,4,LONG,'U'/256
803 036B 5345 A              .WORD   'SE','R'+EVEN,VAR-6
    036C D220 A
    036D 035E A
804 036E 0342 A     USER:    .WORD   DOCOL,CON,PSCODE
    036F 0357 A
    0370 055E A
805                   ;
806 0371 C201 A     DOUSER:  LD      0,1(W)              ; GET OFFSET
807 0372 E022 A              ADD     0,UP                ; ADD USER POINTER
808 0373 98F9 I              JMP     PUSH                ; PUSH ON STACK
```

```
809                  ;
810                  ;************************************************
811                  ;*              DEFINED CONSTANTS              *
812                  ;************************************************
813                  ;
814  0374 81B0 A              HEAD    ORD,1,SHORT,'0'/256
815  0375 036A A              .WORD   USER-4
816  0376 035C A      ZERO:   .WORD   DOCON,0
     0377 0000 A
817                  ;
818  0378 81B1 A              HEAD    ORD,1,SHORT,'1'/256
819  0379 0374 A              .WORD   ZERO-2
820  037A 035C A      ONE:    .WORD   DOCON,1
     037B 0001 A
821                  ;
822  037C 81B2 A              HEAD    ORD,1,SHORT,'2'/256
823  037D 0378 A              .WORD   ONE-2
824  037E 035C A      TWO:    .WORD   DOCON,2
     037F 0002 A
825                  ;
826  0380 81B3 A              HEAD    ORD,1,SHORT,'3'/256
827  0381 037C A              .WORD   TWO-2
828  0382 035C A      THREE:  .WORD   DOCON,3
     0383 0003 A
829                  ;
830  0384 8242 A              HEAD    ORD,2,LONG,'B'/256
831  0385 CC20 A              .WORD   'L'+EVEN,THREE-2
     0386 0380 A
832  0387 035C A      BL:     .WORD   DOCON,' '/256
```

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```
     0388 0020 A
833                  ;
834  0389 8546 A              HEAD    ORD,5,LONG,'F'/256
835  038A 4952 A              .WORD   'IR','ST'+ODD,BL-3
     038B 53D4 A
     038C 0384 A
836  038D 035C A      FIRST:  .WORD   DOCON,BUFFS
     038E 1DF0 A
837                  ;
838  038F 854C A              HEAD    ORD,5,LONG,'L'/256
839  0390 494D A              .WORD   'IM','IT'+ODD,FIRST-4
     0391 49D4 A
     0392 0389 A
840  0393 035C A      LIMIT:  .WORD   DOCON,TOPMEM
     0394 2000 A
841                  ;
842  0395 8542 A              HEAD    ORD,5,LONG,'B'/256
843  0396 2F42 A              .WORD   '/B','UF'+ODD,LIMIT-4
     0397 55C6 A
     0398 038F A
844  0399 035C A      BBUF:   .WORD   DOCON,BLKSIZ
     039A 0080 A
845                  ;
```

```
846 039B 8542 A          HEAD    ORD,5,LONG,'B'/256
847 039C 2F53 A          .WORD   '/S','CR'+ODD,BBUF-4
    039D 43D2 A
    039E 0395 A
848 039F 035C A  BSCR:   .WORD   DOCON,1024/BLKSIZ
    03A0 0008 A
849              ;
850              ;      THE FOLLOWING WORD EXPECTS A WORD-OFFSET
851              ;           AND RETURNS A WORD-ADDRESS.
852              ;
853 03A1 872B A          HEAD    ORD,7,LONG,'+'/256
854 03A2 4F52 A          .WORD   'OR','IG','IN'+ODD,BSCR-4
    03A3 4947 A
    03A4 49CE A
    03A5 039B A
855 03A6 0342 A  PORIG:  .WORD   DOCOL,LIT,ORIG,PLUS,SEMIS
    03A7 0103 A
    03A8 0010 A
    03A9 029F A
    03AA 026A A
856              ;
857              ;******************************************************
858              ;*                 USER VARIABLES                    *
859              ;******************************************************
860              ;
861 03AB 8253 A          HEAD    ORD,2,LONG,'S'/256
862 03AC B020 A          .WORD   '0'+EVEN,PORIG-5
    03AD 03A1 A
863 03AE 0371 A  SZERO:  .WORD   DOUSER,03
    03AF 0003 A
864              ;
865 03B0 8252 A          HEAD    ORD,2,LONG,'R'/256
```

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```
866 03B1 B020 A          .WORD   '0'+EVEN,SZERO-3
    03B2 03AB A
867 03B3 0371 A  RZERO:  .WORD   DOUSER,04
    03B4 0004 A
868              ;
869 03B5 8354 A          HEAD    ORD,3,LONG,'T'/256
870 03B6 49C2 A          .WORD   'IB'+ODD,RZERO-3
    03B7 03B0 A
871 03B8 0371 A  TIB:    .WORD   DOUSER,05
    03B9 0005 A
872              ;
873 03BA 8557 A          HEAD    ORD,5,LONG,'W'/256
874
875 03BB 4944 A          .WORD   'ID','TH'+ODD,TIB-3
    03BC 54C8 A
    03BD 03B5 A
876 03BE 0371 A  WIDTH:  .WORD   DOUSER,06
    03BF 0006 A
877              ;
```

```
878 03C0 8757 A                 HEAD       ORD,7,LONG,'W'/256
879 03C1 4152 A                 .WORD      'AR','NI','NG'+ODD,WIDTH-4
    03C2 4E49 A
    03C3 4EC7 A
    03C4 03BA A
880 03C5 0371 A   WARN:         .WORD      DOUSER,07
    03C6 0007 A
881              ;
882 03C7 8546 A                 HEAD       ORD,5,LONG,'F'/256
883 03C8 454E A                 .WORD      'EN','CE'+ODD,WARN-5
    03C9 43C5 A
    03CA 03C0 A
884 03CB 0371 A   FENCE:        .WORD      DOUSER,08
    03CC 0008 A
885              ;
886 03CD 8244 A                 HEAD       ORD,2,LONG,'D'/256
887 03CE D020 A                 .WORD      'P'+EVEN,FENCE-4
    03CF 03C7 A
888 03D0 0371 A   DP:           .WORD      DOUSER,09
    03D1 0009 A
889              ;
890 03D2 8856 A                 HEAD       ORD,8,LONG,'V'/256
891 03D3 4F43 A                 .WORD      'OC','-L','IN','K'+EVEN,DP-3
    03D4 2D4C A
    03D5 494E A
    03D6 CB20 A
    03D7 03CD A
892 03D8 0371 A   VOCL:         .WORD      DOUSER,0A
    03D9 000A A
893              ;
894 03DA 8342 A                 HEAD       ORD,3,LONG,'B'/256
895 03DB 4CCB A                 .WORD      'LK'+ODD,VOCL-6
    03DC 03D2 A
896 03DD 0371 A   BLK:          .WORD      DOUSER,0B
    03DE 000B A
897              ;
```

```
898 03DF 8249 A                 HEAD       ORD,2,LONG,'I'/256
899 03E0 CE20 A                 .WORD      'N'+EVEN,BLK-3
    03E1 03DA A
900 03E2 0371 A   IN:           .WORD      DOUSER,0C
    03E3 000C A
901              ;
902 03E4 834F A                 HEAD       ORD,3,LONG,'O'/256
903 03E5 55D4 A                 .WORD      'UT'+ODD,IN-3
    03E6 03DF A
904 03E7 0371 A   OUT:          .WORD      DOUSER,0D
    03E8 000D A
905              ;
906 03E9 8353 A                 HEAD       ORD,3,LONG,'S'/256
907 03EA 43D2 A                 .WORD      'CR'+ODD,OUT-3
    03EB 03E4 A
908 03EC 0371 A   SCR:          .WORD      DOUSER,0E
    03ED 000E A
```

```
 909                         ;
 910 03EE 864F A             HEAD      ORD,6,LONG,'O'/256
 911 03EF 4646 A             .WORD     'FF','SE','T'+EVEN,SCR-3
     03F0 5345 A
     03F1 D420 A
     03F2 03E9 A
 912 03F3 0371 A   OFFSET:   .WORD     DOUSER,OF
     03F4 000F A
 913                         ;
 914 03F5 8743 A             HEAD      ORD,7,LONG,'C'/256
 915 03F6 4F4E A             .WORD     'ON','TE','XT'+ODD,OFFSET-5
     03F7 5445 A
     03F8 58D4 A
     03F9 03EE A
 916 03FA 0371 A   CONT:     .WORD     DOUSER,010
     03FB 0010 A
 917                         ;
 918 03FC 8743 A             HEAD      ORD,7,LONG,'C'/256
 919 03FD 5552 A             .WORD     'UR','RE','NT'+ODD,CONT-5
     03FE 5245 A
     03FF 4ED4 A
     0400 03F5 A
 920 0401 0371 A   CURR:     .WORD     DOUSER,011
     0402 0011 A
 921                         ;
 922 0403 8553 A             HEAD      ORD,5,LONG,'S'/256
 923 0404 5441 A             .WORD     'TA','TE'+ODD,CURR-5
     0405 54C5 A
     0406 03FC A
 924 0407 0371 A   STATE:    .WORD     DOUSER,012
     0408 0012 A
 925                         ;
 926 0409 8442 A             HEAD      ORD,4,LONG,'B'/256
 927 040A 4153 A             .WORD     'AS','E'+EVEN,STATE-4
     040B C520 A
     040C 0403 A
 928 040D 0371 A   BASE:     .WORD     DOUSER,013
     040E 0013 A
```

```
 929                         ;
 930 040F 8344 A             HEAD      ORD,3,LONG,'D'/256
 931 0410 50CC A             .WORD     'PL'+ODD,BASE-4
     0411 0409 A
 932 0412 0371 A   DPL:      .WORD     DOUSER,014
     0413 0014 A
 933                         ;
 934 0414 8346 A             HEAD      ORD,3,LONG,'F'/256
 935 0415 4CC4 A             .WORD     'LD'+ODD,DPL-3
     0416 040F A
 936 0417 0371 A   FLD:      .WORD     DOUSER,015
     0418 0015 A
 937                         ;
```

```
938  0419  8343  A              HEAD     ORD,3,LONG,'C'/256
939  041A  53D0  A              .WORD    'SP'+ODD,FLD-3
     041B  0414  A
940  041C  0371  A    CSP:       .WORD    DOUSER,016
     041D  0016  A
941                   ;
942  041E  8252  A              HEAD     ORD,2,LONG,'R'/256
943  041F  A320  A              .WORD    ','+EVEN,CSP-3
     0420  0419  A
944  0421  0371  A    RNUM:      .WORD    DOUSER,017
     0422  0017  A
945                   ;
946  0423  8348  A              HEAD     ORD,3,LONG,'H'/256
947  0424  4CC4  A              .WORD    'LD'+ODD,RNUM-3
     0425  041E  A
948  0426  0371  A    HLD:       .WORD    DOUSER,018
     0427  0018  A
949                   ;
950                   ;***********************************************************
951                   ;*                    MISCELLANEOUS                        *
952                   ;***********************************************************
953                   ;
954  0428  8231  A              HEAD     ORD,2,LONG,'1'/256
955  0429  AB20  A              .WORD    '+'+EVEN,HLD-3
     042A  0423  A
956  042B  042C  A    ONEP:      .WORD    .+1
957  042C  8F00  A              ISZ      0(SP)            ; ADD ONE
958  042D  98F8  I              JMP      NEXT             ;  TO BOTTOM
959  042E  98F8  I              JMP      NEXT             ;   OF STACK
960                   ;
961  042F  8232  A              HEAD     ORD,2,LONG,'2'/256
962  0430  AB20  A              .WORD    '+'+EVEN,ONEP-3
     0431  0428  A
963  0432  0342  A    TWOP:      .WORD    DOCOL,TWO,PLUS,SEMIS
     0433  037E  A
     0434  029F  A
     0435  026A  A
964                   ;
965  0436  8448  A              HEAD     ORD,4,LONG,'H'/256
966  0437  4552  A              .WORD    'ER','E'+EVEN,TWOP-3
     0438  C520  A
     0439  042F  A
```

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```
967  043A  0342  A    HERE:      .WORD    DOCOL,DP,AT,SEMIS
     043B  03D0  A
     043C  030B  A
     043D  026A  A
968                   ;
969  043E  8541  A              HEAD     ORD,5,LONG,'A'/256
970  043F  4C4C  A              .WORD    'LL','OT'+ODD,HERE-4
     0440  4FD4  A
     0441  0436  A
```

```
 971  0442  0342  A    ALLOT:   .WORD    DOCOL,DP,PSTORE,SEMIS
       0443  03D0  A
       0444  02E3  A
       0445  026A  A
 972                    ;
 973                    ;   :  ,    HERE  !  1 ALLOT  ;
 974                    ;
 975  0446  81AC  A             HEAD     ORD,1,SHORT,',',/256
 976  0447  043E  A             .WORD    ALLOT-4
 977  0448  0342  A    COMMA:   .WORD    DOCOL,HERE,STORE,ONE,ALLOT,SEMIS
       0449  043A  A
       044A  031D  A
       044B  037A  A
       044C  0442  A
       044D  026A  A
 978                    ;
 979  044E  81AD  A             HEAD     ORD,1,SHORT,'-'/256
 980  044F  0446  A             .WORD    COMMA-2
 981  0450  0451  A    SUB:     .WORD    .+1
 982  0451  C301  A             LD       0,1(SP)        ; GET MINUEND
 983  0452  3780  A             SFLG     CRY            ; CLEAR BORROW
 984  0453  9300  A             SUBB     0,0(SP)        ; SUBTRACT SUBTRAHEND
 985  0454  98F6  I             JMP      BIN
 986                    ;
 987  0455  81BD  A             HEAD     ORD,1,SHORT,'='/256
 988  0456  044E  A             .WORD    SUB-2
 989  0457  0342  A    EQUAL:   .WORD    DOCOL,SUB,ZEQU,SEMIS
       0458  0450  A
       0459  028F  A
       045A  026A  A
 990                    ;
 991  045B  81BC  A             HEAD     ORD,1,SHORT,'<'/256
 992  045C  0455  A             .WORD    EQUAL-2
 993  045D  0342  A    LESS:    .WORD    DOCOL,SUB,ZLESS,SEMIS
       045E  0450  A
       045F  0297  A
       0460  026A  A
 994                    ;
 995  0461  81BE  A             HEAD     ORD,1,SHORT,'>'/256
 996  0462  045B  A             .WORD    LESS-2
 997  0463  0342  A    GREAT:   .WORD    DOCOL,SWAP,LESS,SEMIS
       0464  02D5  A
       0465  045D  A
       0466  026A  A
 998                    ;
 999  0467  8352  A             HEAD     ORD,3,LONG,'R'/256
```

```
1000  0468  4FD4  A             .WORD    'OT'+ODD,GREAT-2
       0469  0461  A
1001  046A  046B  A    ROT:     .WORD    .+1
1002  046B  C302  A             LD       0,2(SP)        ; GET THIRD
1003  046C  CB01  A             LD       X,1(SP)        ; MOVE SECOND
```

```
1004 046D DB02 A              ST       X,2(SP)           ;   TO THIRD
1005 046E CB00 A              LD       X,0(SP)           ; MOVE BOTTOM
1006 046F DB01 A              ST       X,1(SP)           ;   TO SECOND
1007 0470 98F7 I              JMP      PUT               ; PUT THIRD ON BOTTOM
1008                  ;
1009 0471 8553 A              HEAD     ORD,5,LONG,'S'/256
1010 0472 5041 A              .WORD    'PA','CE'+ODD,ROT-3
     0473 43C5 A
     0474 0467 A
1011 0475 0342 A  SPACE:      .WORD    DOCOL,BL,EMIT,SEMIS
     0476 0387 A
     0477 01ED A
     0478 026A A
1012                  ;
1013 0479 842D A              HEAD     ORD,4,LONG,'-'/256
1014 047A 4455 A              .WORD    'DU','P'+EVEN,SPACE-4
     047B D020 A
     047C 0471 A
1015 047D 047E A  DDUP:       .WORD    .+1
1016 047E C300 A              LD       0,0(SP)           ; GET BOTTOM OF STACK
1017 047F 4101 A              BOC      Z,.+2
1018 0480 98F9 I              JMP      PUSH              ; DUP IF NOT ZERO
1019 0481 98F8 I              JMP      NEXT
1020                  ;
1021                  ;*********************************************
1022                  ;*          VARIABLE LENGTH NAME SUPPORT           *
1023                  ;*********************************************
1024                  ;
1025 0482 8854 A              HEAD     ORD,8,LONG,'T'/256
1026 0483 5241 A              .WORD    'RA','VE','RS','E'+EVEN,DDUP-4
     0484 5645 A
     0485 5253 A
     0486 C520 A
     0487 0479 A
1027 0488 0342 A  TRAV:       .WORD    DOCOL,SWAP
     0489 02D5 A
1028 048A 02C9 A  TRAV1:      .WORD    OVER,PLUS,LIT,007F
     048B 029F A
     048C 0103 A
     048D 007F A
1029 048E 02C9 A              .WORD    OVER,CAT,LESS,ZBRAN
     048F 0311 A
     0490 045D A
     0491 0124 A
1030 0492 FFF8 A              .WORD    TRAV1-.,SWAP,DROP,SEMIS
     0493 02D5 A
     0494 02D0 A
     0495 026A A
1031                  ;
1032 0496 864C A              HEAD     ORD,6,LONG,'L'/256
```

```
1033 0497 4154 A              .WORD    'AT','ES','T'+EVEN,TRAV-6
     0498 4553 A
     0499 D420 A
     049A 0482 A
1034 049B 0342 A   LATEST: .WORD    DOCOL,CURR,AT,AT,SEMIS
     049C 0401 A
     049D 030B A
     049E 030B A
     049F 026A A
1035               ;
1036               ;    : LFA    2    -  ;
1037               ;
1038 04A0 834C A            HEAD    ORD,3,LONG,'L'/256
1039 04A1 46C1 A            .WORD    'FA'+ODD,LATEST-5
     04A2 0496 A
1040 04A3 0342 A   LFA:     .WORD    DOCOL,TWO,SUB,SEMIS
     04A4 037E A
     04A5 0450 A
     04A6 026A A
1041               ;
1042               ;    : CFA    1    -  ;
1043               ;
1044 04A7 8343 A            HEAD    ORD,3,LONG,'C'/256
1045 04A8 46C1 A            .WORD    'FA'+ODD,LFA-3
     04A9 04A0 A
1046 04AA 0342 A   CFA:     .WORD    DOCOL,ONE,SUB,SEMIS
     04AB 037A A
     04AC 0450 A
     04AD 026A A
1047               ;
1048               ;    : NFA    2    -   BYTE   -1   TRAVERSE
1049               ;                      -1   TRAVERSE  CELL   ;
1050               ;
1051 04AE 834E A            HEAD    ORD,3,LONG,'N'/256
1052 04AF 46C1 A            .WORD    'FA'+ODD,CFA-3
     04B0 04A7 A
1053 04B1 0342 A   NFA:     .WORD    DOCOL,TWO,SUB,BYTE,LIT,-1
     04B2 037E A
     04B3 0450 A
     04B4 02FD A
     04B5 0103 A
     04B6 FFFF A
1054 04B7 0488 A            .WORD    TRAV,LIT,-1,TRAV,CELL,SEMIS
     04B8 0103 A
     04B9 FFFF A
     04BA 0488 A
     04BB 0305 A
     04BC 026A A
1055               ;
1056               ;    : PFA    BYTE   1   TRAVERSE   CELL   3   +  ;
1057               ;
1058 04BD 8350 A            HEAD    ORD,3,LONG,'P'/256
1059 04BE 46C1 A            .WORD    'FA'+ODD,NFA-3
     04BF 04AE A
1060 04C0 0342 A   PFA:     .WORD    DOCOL,BYTE,ONE,TRAV
```

```
          04C1 02FD  A
          04C2 037A  A
          04C3 0488  A
1061      04C4 0305  A                   .WORD     CELL,THREE,PLUS,SEMIS
          04C5 0382  A
          04C6 029F  A
          04C7 026A  A
1062                          ;
1063                          ;*************************************************
1064                          ;*           ERROR PROCEDURES, PER SHIRA         *
1065                          ;*************************************************
1066                          ;
1067      04C8 8421  A                   HEAD      ORD,4,LONG,'!'/256
1068      04C9 4353  A                   .WORD     'CS','P'+EVEN,PFA-3
          04CA D020  A
          04CB 04BD  A
1069      04CC 0342  A        SCSP:       .WORD     DOCOL,SPAT,CSP,STORE,SEMIS
          04CD 0255  A
          04CE 041C  A
          04CF 031D  A
          04D0 026A  A
1070                          ;
1071      04D1 863F  A                   HEAD      ORD,6,LONG,'?'/256
1072      04D2 4552  A                   .WORD     'ER','RO','R'+EVEN,SCSP-4
          04D3 524F  A
          04D4 D220  A
          04D5 04C8  A
1073      04D6 0342  A        QERROR:     .WORD     DOCOL,SWAP,ZBRAN
          04D7 02D5  A
          04D8 0124  A
1074      04D9 0004  A                    .WORD     QERR1-.,ERROR,BRAN
          04DA 0744  A
          04DB 011B  A
1075      04DC 0002  A                    .WORD     QERR2-.
1076      04DD 02D0  A        QERR1:      .WORD     DROP
1077      04DE 026A  A        QERR2:      .WORD     SEMIS
1078                          ;
1079      04DF 853F  A                    HEAD      ORD,5,LONG,'?'/256
1080      04E0 434F  A                    .WORD     'CO','MP'+ODD,QERROR-5
          04E1 4DD0  A
          04E2 04D1  A
1081      04E3 0342  A        QCOMP:      .WORD     DOCOL,STATE,AT,ZEQU
          04E4 0407  A
          04E5 030B  A
          04E6 028F  A
1082      04E7 0103  A                    .WORD     LIT,0011,QERROR,SEMIS
          04E8 0011  A
          04E9 04D6  A
          04EA 026A  A
1083                          ;
1084      04EB 853F  A                    HEAD      ORD,5,LONG,'?'/256
1085      04EC 4558  A                    .WORD     'EX','EC'+ODD,QCOMP-4
          04ED 45C3  A
          04EE 04DF  A
1086      04EF 0342  A        QEXEC:      .WORD     DOCOL,STATE,AT
```

```
          04F0  0407 A
          04F1  030B A
1087      04F2  0103 A                  .WORD     LIT,0012,QERROR,SEMIS
          04F3  0012 A
          04F4  04D6 A
          04F5  026A A
1088                         ;
1089      04F6  863F A                  HEAD      ORD,6,LONG,'?'/256
1090      04F7  5041 A                  .WORD     'PA','IR','S'+EVEN,QEXEC-4
          04F8  4952 A
          04F9  D320 A
          04FA  04EB A
1091      04FB  0342 A       QPAIRS:     .WORD     DOCOL,SUB,LIT,0013,QERROR,SEMIS
          04FC  0450 A
          04FD  0103 A
          04FE  0013 A
          04FF  04D6 A
          0500  026A A
1092                         ;
1093      0501  843F A                  HEAD      ORD,4,LONG,'?'/256
1094      0502  4353 A                  .WORD     'CS','P'+EVEN,QPAIRS-5
          0503  D020 A
          0504  04F6 A
1095      0505  0342 A       QCSP:       .WORD     DOCOL,SPAT,CSP,AT,SUB
          0506  0255 A
          0507  041C A
          0508  030B A
          0509  0450 A
1096      050A  0103 A                  .WORD     LIT,0014,QERROR,SEMIS
          050B  0014 A
          050C  04D6 A
          050D  026A A
1097                         ;
1098      050E  883F A                  HEAD      ORD,8,LONG,'?'/256
1099      050F  4C4F A                  .WORD     'LO','AD','IN','G'+EVEN,QCSP-4
          0510  4144 A
          0511  494E A
          0512  C720 A
          0513  0501 A
1100      0514  0342 A       QLOAD:      .WORD     DOCOL,BLK,AT,ZEQU
          0515  03DD A
          0516  030B A
          0517  028F A
1101      0518  0103 A                  .WORD     LIT,0016,QERROR,SEMIS
          0519  0016 A
          051A  04D6 A
          051B  026A A
1102                         ;
1103                         ;********************************************
1104                         ;*          COMPILE, SMUDGE, HEX, DECIMAL          *
1105                         ;********************************************
1106                         ;
1107                         ;    : COMPILE   ?COMP  R>  DUP  1+  >R  @  ,  ;
1108                         ;
1109      051C  8743 A                  HEAD      ORD,7,LONG,'C'/256
```

```
1110  051D  4F4D  A              .WORD    'OM','PI','LE'+ODD,QLOAD-6
      051E  5049  A
      051F  4CC5  A
      0520  050E  A
1111  0521  0342  A    COMPIL:   .WORD    DOCOL,QCOMP,FROMR,DUP
      0522  04E3  A
      0523  0283  A
      0524  02DD  A
1112  0525  042B  A              .WORD    ONEP,TOR,AT,COMMA,SEMIS
      0526  027B  A
      0527  030B  A
      0528  0448  A
      0529  026A  A
1113                   ;
1114  052A  C1DB  A              HEAD     IMM,1,SHORT,'['/256
1115  052B  051C  A              .WORD    COMPIL-5
1116  052C  0342  A    LBRAC:    .WORD    DOCOL,ZERO,STATE,STORE,SEMIS
      052D  0376  A
      052E  0407  A
      052F  031D  A
      0530  026A  A
1117                   ;
1118  0531  81DD  A              HEAD     ORD,1,SHORT,']'/256
1119  0532  052A  A              .WORD    LBRAC-2
1120  0533  0342  A    RBRAC:    .WORD    DOCOL,LIT,00C0
      0534  0103  A
      0535  00C0  A
1121  0536  0407  A              .WORD    STATE,STORE,SEMIS
      0537  031D  A
      0538  026A  A
1122                   ;
1123                   ;    : SMUDGE   LATEST   BYTE   20   TOGGLE   ;
1124                   ;
1125  0539  8653  A              HEAD     ORD,6,LONG,'S'/256
1126  053A  4D55  A              .WORD    'MU','DG','E'+EVEN,RBRAC-2
      053B  4447  A
      053C  C520  A
      053D  0531  A
1127  053E  0342  A    SMUDGE:   .WORD    DOCOL,LATEST,BYTE
      053F  049B  A
      0540  02FD  A
1128  0541  0103  A              .WORD    LIT,0020,TOGGLE,SEMIS
      0542  0020  A
      0543  02ED  A
      0544  026A  A
1129                   ;
1130  0545  8348  A              HEAD     ORD,3,LONG,'H'/256
1131  0546  45D8  A              .WORD    'EX'+ODD,SMUDGE-5
      0547  0539  A
1132  0548  0342  A    HEX:      .WORD    DOCOL,LIT,0010,BASE,STORE,SEMIS
      0549  0103  A
      054A  0010  A
      054B  040D  A
      054C  031D  A
      054D  026A  A
```

```
1133                      ;
1134  054E  8744  A               HEAD      ORD,7,LONG,'D'/256
1135  054F  4543  A               .WORD     'EC','IM','AL'+ODD,HEX-3
      0550  494D  A
      0551  41CC  A
      0552  0545  A
1136  0553  0342  A       DEC:    .WORD     DOCOL,LIT,0A,BASE,STORE,SEMIS
      0554  0103  A
      0555  000A  A
      0556  040D  A
      0557  031D  A
      0558  026A  A
1137                      ;
1138                      ;*******************************************
1139                      ;*                         ;CODE            *
1140                      ;*******************************************
1141                      ;
1142  0559  8728  A               HEAD      ORD,7,LONG,'('/256
1143  055A  3B43  A               .WORD     ';C','OD','E)'+ODD,DEC-5
      055B  4F44  A
      055C  45A9  A
      055D  054E  A
1144  055E  0342  A       PSCODE: .WORD     DOCOL,FROMR,LATEST
      055F  0283  A
      0560  049B  A
1145  0561  04C0  A               .WORD     PFA,CFA,STORE,SEMIS
      0562  04AA  A
      0563  031D  A
      0564  026A  A
1146                      ;
1147                      ;
1148  0565  C53B  A               HEAD      IMM,5,LONG,';'/256
1149  0566  434F  A               .WORD     'CO','DE'+ODD,PSCODE-5
      0567  44C5  A
      0568  0559  A
1150  0569  0342  A       SEMIC:  .WORD     DOCOL,QCSP,COMPIL,PSCODE
      056A  0505  A
      056B  0521  A
      056C  055E  A
1151  056D  052C  A               .WORD     LBRAC,SMUDGE,SEMIS
      056E  053E  A
      056F  026A  A
1152                      ;
1153                      ;*******************************************
1154                      ;*               <BUILDS, DOES>            *
1155                      ;*******************************************
1156                      ;
1157  0570  873C  A               HEAD      ORD,7,LONG,'<'/256
1158  0571  4255  A               .WORD     'BU','IL','DS'+ODD,SEMIC-4
      0572  494C  A
      0573  44D3  A
      0574  0565  A
1159  0575  0342  A       BUILDS: .WORD     DOCOL,ZERO,CON,SEMIS
      0576  0376  A
      0577  0357  A
```

```
        0578 026A A
1160                         ;
1161 0579 8544 A                    HEAD        ORD,5,LONG,'D'/256
1162 057A 4F45 A                    .WORD       'OE','S>'+ODD,BUILDS-5
     057B 53BE A
     057C 0570 A
1163 057D 0342 A    DOES:   .WORD       DOCOL,FROMR,LATEST,PFA,STORE,PSCODE
     057E 0283 A
     057F 049B A
     0580 04C0 A
     0581 031D A
     0582 055E A
1164                         ;
1165 0583 AC21 A    DODOES: DSZ         RP                  ; EXTEND RETURN STACK
1166 0584 5C40 A            RCPY        IP,0
1167 0585 B021 A            ST          0,@RP               ; PUSH IP
1168 0586 C601 A            LD          1,1(W)              ; LOAD IP FROM PARAM
1169 0587 5002 A            LI          0,2                 ; POINT BOTTOM
1170 0588 6880 A            RADD        W,0                 ;   OF STACK
1171 0589 98F9 I            JMP         PUSH                ;     TO PFA+1
1172                         ;
1173                         ;**************************************************
1174                         ;*                   TEXT OUTPUTS                 *
1175                         ;**************************************************
1176                         ;
1177                         ;   : COUNT   BYTE   DUP   1+   SWAP   C@   ;
1178                         ;
1179 058A 8543 A                    HEAD        ORD,5,LONG,'C'/256
1180 058B 4F55 A                    .WORD       'OU','NT'+ODD,DOES-4
     058C 4ED4 A
     058D 0579 A
1181 058E 0342 A    COUNT:  .WORD       DOCOL,BYTE,DUP,ONEP,SWAP,CAT,SEMIS
     058F 02FD A
     0590 02DD A
     0591 042B A
     0592 02D5 A
     0593 0311 A
     0594 026A A
1182                         ;
1183 0595 8454 A                    HEAD        ORD,4,LONG,'T'/256
1184 0596 5950 A                    .WORD       'YP','E'+EVEN,COUNT-4
     0597 C520 A
     0598 058A A
1185 0599 0342 A    TYPE:   .WORD       DOCOL,DDUP,ZBRAN
     059A 047D A
     059B 0124 A
1186 059C 000C A            .WORD       TYPE2-.,OVER,PLUS,SWAP,XDO
     059D 02C9 A
     059E 029F A
     059F 02D5 A
     05A0 0155 A
1187 05A1 0161 A    TYPE1:  .WORD       I,CAT,EMIT,XLOOP
     05A2 0311 A
     05A3 01ED A
     05A4 012F A
```

```
1188  05A5 FFFC A                  .WORD    TYPE1-.,BRAN
      05A6 011B A
1189  05A7 0002 A                  .WORD    TYPE3-.
1190  05A8 02D0 A      TYPE2:      .WORD    DROP
1191  05A9 026A A      TYPE3:      .WORD    SEMIS
1192                               ;
1193  05AA 892D A                  HEAD     ORD,9,LONG,'-'/256
1194  05AB 5452 A                  .WORD    'TR','AI','LI','NG'+ODD,TYPE-4
      05AC 4149 A
      05AD 4C49 A
      05AE 4EC7 A
      05AF 0595 A
1195  05B0 0342 A      DTRAIL:     .WORD    DOCOL,DUP,ZERO,XDO
      05B1 02DD A
      05B2 0376 A
      05B3 0155 A
1196  05B4 02C9 A      DTRA1:      .WORD    OVER,OVER,PLUS,ONE,SUB
      05B5 02C9 A
      05B6 029F A
      05B7 037A A
      05B8 0450 A
1197  05B9 0311 A                  .WORD    CAT,BL,SUB,ZBRAN
      05BA 0387 A
      05BB 0450 A
      05BC 0124 A
1198  05BD 0004 A                  .WORD    DTRA2-.,LEAVE,BRAN
      05BE 0273 A
      05BF 011B A
1199  05C0 0003 A                  .WORD    DTRA3-.
1200  05C1 037A A      DTRA2:      .WORD    ONE,SUB
      05C2 0450 A
1201  05C3 012F A      DTRA3:      .WORD    XLOOP
1202  05C4 FFF0 A                  .WORD    DTRA1-.,SEMIS
      05C5 026A A
1203                               ;
1204                               ;   : (.")   R  COUNT  DUP  CELL  1+
1205                               ;           R>  +  >R  TYPE  ;
1206                               ;
1207  05C6 8428 A                  HEAD     ORD,4,LONG,'('/256
1208  05C7 2E22 A                  .WORD    '."',')'+EVEN,DTRAIL-6
      05C8 A920 A
      05C9 05AA A
1209  05CA 0342 A      PDOTQ:      .WORD    DOCOL,R,COUNT,DUP,CELL,ONEP
      05CB 0289 A
      05CC 058E A
      05CD 02DD A
      05CE 0305 A
      05CF 042B A
1210  05D0 0283 A                  .WORD    FROMR,PLUS,TOR,TYPE,SEMIS
      05D1 029F A
      05D2 027B A
      05D3 0599 A
      05D4 026A A
1211                               ;
1212                               ;   : ."   22  STATE  @  IF  COMPILE  (.")  WORD]
```

```
1213                    ;           HERE  BYTE  C@  CELL  1+  ALLOT  ELSE
1214                    ;           WORD  HERE  COUNT  TYPE  ENDIF  ;
1215                    ;              IMMEDIATE
1216                    ;
1217 05D5 C22E A                    HEAD      IMM,2,LONG,'.'/256
1218 05D6 A220 A                    .WORD     '"'+EVEN,PDOTQ-4
     05D7 05C6 A
1219 05D8 0342 A        DOTQ:       .WORD     DOCOL,LIT,'"'/256,STATE,AT,ZBRAN
     05D9 0103 A
     05DA 0022 A
     05DB 0407 A
     05DC 030B A
     05DD 0124 A
1220 05DE 000C A                    .WORD     DOTQ1-.,COMPIL,PDOTQ,WORD
     05DF 0521 A
     05E0 05CA A
     05E1 06A8 A
1221 05E2 043A A                    .WORD     HERE,BYTE,CAT,CELL,ONEP,ALLOT,BRAN
     05E3 02FD A
     05E4 0311 A
     05E5 0305 A
     05E6 042B A
     05E7 0442 A
     05E8 011B A
1222 05E9 0005 A                    .WORD     DOTQ2-.
1223 05EA 06A8 A        DOTQ1:      .WORD     WORD,HERE,COUNT,TYPE
     05EB 043A A
     05EC 058E A
     05ED 0599 A
1224 05EE 026A A        DOTQ2:      .WORD     SEMIS
1225                    ;
1226                                .LIST     PART=2
     05ED 0599 A
1224 05EE 026A A        DOTQ2:      .WORD     SEMIS
1225                    ;
1226                    024 05EE 026A A   DOTQ2:   .WORD    SEMIS
1225                    ;
1226                    PACE ASSEMBLER REV-A 05/23/75
FORTH NUCLEUS FOR PACE
```

```
1227            ;
1228            ;*************************************************************
1229            ;*                   TERMINAL INPUT                          *
1230            ;*************************************************************
1231            ;
1232            ;       : EXPECT    OVER   +   OVER   DO   KEY   DUP
1233            ;                   07   +ORIGIN   @   =   IF   DROP   08
1234            ;                   OVER   I   =   DUP   R>   2   -   +   >R   -
1235            ;                   ELSE   DUP   0D   =
1236            ;                     IF   LEAVE   DROP   BL   0   ELSE   DUP
1237            ;                     ENDIF   I   C!   0   I   1+   C!
1238            ;                   ENDIF   EMIT   LOOP   DROP   ;
1239            ;
1240  05EF 8645 A          HEAD      ORD,6,LONG,'E'/256
1241  05F0 5850 A          .WORD     'XP','EC','T'+EVEN,DOTQ-3
      05F1 4543 A
      05F2 D420 A
      05F3 05D5 A
1242  05F4 0342 A  EXPECT: .WORD     DOCOL,OVER,PLUS,OVER,XDO
      05F5 02C9 A
      05F6 029F A
      05F7 02C9 A
      05F8 0155 A
1243  05F9 01F1 A  EXPEC1: .WORD     KEY,DUP,LIT,07,PORIG,AT,EQUAL,ZBRAN
      05FA 02DD A
      05FB 0103 A
      05FC 0007 A
      05FD 03A6 A
      05FE 030B A
      05FF 0457 A
      0600 0124 A
1244  0601 0010 A          .WORD     EXPEC2-.,DROP,LIT,08,OVER,I,EQUAL
      0602 02D0 A
      0603 0103 A
      0604 0008 A
      0605 02C9 A
      0606 0161 A
      0607 0457 A
1245  0608 02DD A          .WORD     DUP,FROMR,TWO,SUB,PLUS,TOR,SUB,BRAN
      0609 0283 A
      060A 037E A
      060B 0450 A
      060C 029F A
      060D 027B A
      060E 0450 A
```

```
          060F  011B  A
1246 0610 0014  A                   .WORD   EXPEC5-.
1247 0611 02DD  A       EXPEC2: .WORD   DUP,LIT,0D,EQUAL,ZBRAN
     0612 0103  A
     0613 000D  A
     0614 0457  A
     0615 0124  A
1248 0616 0007  A               .WORD   EXPEC3-.,LEAVE,DROP,BL,ZERO,BRAN
     0617 0273  A
     0618 02D0  A
     0619 0387  A
     061A 0376  A
     061B 011B  A
1249 061C 0002  A               .WORD   EXPEC4-.
1250 061D 02DD  A       EXPEC3: .WORD   DUP
1251 061E 0161  A       EXPEC4: .WORD   I,CSTORE,ZERO,I,ONEP,CSTORE
     061F 0324  A
     0620 0376  A
     0621 0161  A
     0622 042B  A
     0623 0324  A
1252 0624 01ED  A       EXPEC5: .WORD   EMIT,XLOOP
     0625 012F  A
1253 0626 FFD3  A               .WORD   EXPEC1-.,DROP,SEMIS
     0627 02D0  A
     0628 026A  A
1254                    ;
1255                    ;    : QUERY   TIB  @  BYTE  50  EXPECT  0  IN  !  ;
1256                    ;
1257 0629 8551  A               HEAD    ORD,5,LONG,'Q'/256
1258 062A 5545  A               .WORD   'UE','RY'+ODD,EXPECT-5
     062B 52D9  A
     062C 05EF  A
1259 062D 0342  A       QUERY:  .WORD   DOCOL,TIB,AT,BYTE,LIT,0050
     062E 03B8  A
     062F 030B  A
     0630 02FD  A
     0631 0103  A
     0632 0050  A
1260 0633 05F4  A               .WORD   EXPECT,ZERO,IN,STORE,SEMIS
     0634 0376  A
     0635 03E2  A
     0636 031D  A
     0637 026A  A
1261                    ;
1262 0638 C180  A               HEAD    IMM,1,SHORT,00          ; NULL
1263 0639 0629  A               .WORD   QUERY-4
1264 063A 0342  A       NULL:   .WORD   DOCOL,BLK,AT,ZBRAN
     063B 03DD  A
     063C 030B  A
     063D 0124  A
1265 063E 0013  A               .WORD   NULL2-.
1266 063F 037A  A               .WORD   ONE,BLK,PSTORE,ZERO,IN,STORE
     0640 03DD  A
     0641 02E3  A
```

```
        0642 0376 A
        0643 03E2 A
        0644 031D A
1267    0645 03DD A                  .WORD     BLK,AT,BSCR,MOD,ZEQU,ZBRAN
        0646 030B A
        0647 039F A
        0648 0919 A
        0649 028F A
        064A 0124 A
1268    064B 0004 A                  .WORD     NULL1-.,QEXEC,FROMR,DROP
        064C 04EF A
        064D 0283 A
        064E 02D0 A
1269    064F 011B A     NULL1:       .WORD     BRAN
1270    0650 0003 A                  .WORD     NULL3-.
1271    0651 0283 A     NULL2:       .WORD     FROMR,DROP
        0652 02D0 A
1272    0653 026A A     NULL3:       .WORD     SEMIS
1273                    ;
1274                    ;***************************************************
1275                    ;*       FILL, ERASE, BLANKS, HOLD, PAD, CMOVE    *
1276                    ;***************************************************
1277                    ;
1278                    ;        NOTE THAT THE NEXT THREE WORDS FILL
1279                    ;               16-BIT WORDS, NOT BYTES.
1280                    ;
1281                    ;   : FILL   SWAP  >R  OVER  !  DUP  1+
1282                    ;             R>  1  -  MOVE  ;
1283                    ;
1284    0654 8446 A                  HEAD      ORD,4,LONG,'F'/256
1285    0655 494C A                  .WORD     'IL','L'+EVEN,NULL-2
        0656 CC20 A
        0657 0638 A
1286    0658 0342 A     FILL:        .WORD     DOCOL,SWAP,TOR,OVER,STORE,DUP
        0659 02D5 A
        065A 027B A
        065B 02C9 A
        065C 031D A
        065D 02DD A
1287    065E 042B A                  .WORD     ONEP,FROMR,ONE,SUB,MOVE,SEMIS
        065F 0283 A
        0660 037A A
        0661 0450 A
        0662 0201 A
        0663 026A A
1288                    ;
1289    0664 8545 A                  HEAD      ORD,5,LONG,'E'/256
1290    0665 5241 A                  .WORD     'RA','SE'+ODD,FILL-4
        0666 53C5 A
        0667 0654 A
1291    0668 0342 A     ERASE:       .WORD     DOCOL,ZERO,FILL,SEMIS
        0669 0376 A
        066A 0658 A
        066B 026A A
1292                    ;
```

```
1293                    ;   : BLANKS   2020  FILL  ;
1294                    ;
1295 066C 8642 A            HEAD     ORD,6,LONG,'B'/256
1296 066D 4C41 A            .WORD    'LA','NK','S'+EVEN,ERASE-4
     066E 4E4B A
     066F D320 A
     0670 0664 A
1297 0671 0342 A  BLANKS: .WORD    DOCOL,LIT,02020,FILL,SEMIS
     0672 0103 A
     0673 2020 A
     0674 0658 A
     0675 026A A
1298                    ;
1299 0676 8448 A            HEAD     ORD,4,LONG,'H'/256
1300 0677 4F4C A            .WORD    'OL','D'+EVEN,BLANKS-5
     0678 C420 A
     0679 066C A
1301 067A 0342 A  HOLD:   .WORD    DOCOL,LIT,-1,HLD,PSTORE
     067B 0103 A
     067C FFFF A
     067D 0426 A
     067E 02E3 A
1302 067F 0426 A            .WORD    HLD,AT,CSTORE,SEMIS
     0680 030B A
     0681 0324 A
     0682 026A A
1303                    ;
1304                    ;        NOTE THAT PAD IS A WORD ADDRESS.
1305                    ;
1306                    ;   : PAD    HERE   22  +  ;
1307                    ;
1308 0683 8350 A            HEAD     ORD,3,LONG,'P'/256
1309 0684 41C4 A            .WORD    'AD'+ODD,HOLD-4
     0685 0676 A
1310 0686 0342 A  PAD:    .WORD    DOCOL,HERE,LIT,0022,PLUS,SEMIS
     0687 043A A
     0688 0103 A
     0689 0022 A
     068A 029F A
     068B 026A A
1311                    ;
1312                    ;   : CMOVE   -DUP  IF  OVER  +  SWAP  DO
1313                    ;           DUP  C@  I  C!  1+  LOOP
1314                    ;           ELSE  DROP  ENDIF  DROP  ;
1315                    ;
1316 068C 8543 A            HEAD     ORD,5,LONG,'C'/256
1317 068D 4D4F A            .WORD    'MO','VE'+ODD,PAD-3
     068E 56C5 A
     068F 0683 A
1318 0690 0342 A  CMOVE:  .WORD    DOCOL,DDUP,ZBRAN
     0691 047D A
     0692 0124 A
1319 0693 000E A            .WORD    CMOVE2-.,OVER,PLUS,SWAP,XDO
     0694 02C9 A
     0695 029F A
```

```
          0696  02D5  A
          0697  0155  A
1320      0698  02DD  A    CMOVE1:  .WORD      DUP,CAT,I,CSTORE,ONEP,XLOOP
          0699  0311  A
          069A  0161  A
          069B  0324  A
          069C  042B  A
          069D  012F  A
1321      069E  FFFA  A             .WORD      CMOVE1-.,BRAN
          069F  011B  A
1322      06A0  0002  A             .WORD      CMOVE3-.
1323      06A1  02D0  A    CMOVE2:  .WORD      DROP
1324      06A2  02D0  A    CMOVE3:  .WORD      DROP,SEMIS
          06A3  026A  A
1325                       ;
1326                       ;*************************************************
1327                       ;*                         WORD                   *
1328                       ;*************************************************
1329                       ;
1330                       ;   : WORD    BLK   @   IF   BLK   @   BLOCK   ELSE   TIB   @
1331                       ;                  ENDIF   BYTE   IN   @   +   SWAP   ENCLOSE
1332                       ;                  HERE  11  BLANKS   IN   +!   OVER   -   >R
1333                       ;                  R   HERE   BYTE   C!   +   HERE   BYTE   1+
1334                       ;                  R>   CMOVE   ;
1335                       ;
1336      06A4  8457  A             HEAD       ORD,4,LONG,'W'/256
1337      06A5  4F52  A             .WORD      'OR','D'+EVEN,CMOVE-4
          06A6  C420  A
          06A7  068C  A
1338      06A8  0342  A    WORD:    .WORD      DOCOL,BLK,AT,ZBRAN
          06A9  03DD  A
          06AA  030B  A
          06AB  0124  A
1339      06AC  0006  A             .WORD      WORD1-.,BLK,AT,BLOCK,BRAN
          06AD  03DD  A
          06AE  030B  A
          06AF  09B6  A
          06B0  011B  A
1340      06B1  0003  A             .WORD      WORD2-.
1341      06B2  03B8  A    WORD1:   .WORD      TIB,AT
          06B3  030B  A
1342      06B4  02FD  A    WORD2:   .WORD      BYTE,IN,AT,PLUS,SWAP,ENCL
          06B5  03E2  A
          06B6  030B  A
          06B7  029F  A
          06B8  02D5  A
          06B9  01B1  A
1343      06BA  043A  A             .WORD      HERE,LIT,17,BLANKS,IN,PSTORE
          06BB  0103  A
          06BC  0011  A
          06BD  0671  A
          06BE  03E2  A
          06BF  02E3  A
1344      06C0  02C9  A             .WORD      OVER,SUB,TOR,R,HERE,BYTE,CSTORE
          06C1  0450  A
```

```
          06C2 027B A
          06C3 0289 A
          06C4 043A A
          06C5 02FD A
          06C6 0324 A
1345      06C7 029F A              .WORD    PLUS,HERE,BYTE,ONEP
          06C8 043A A
          06C9 02FD A
          06CA 042B A
1346      06CB 0283 A              .WORD    FROMR,CMOVE,SEMIS
          06CC 0690 A
          06CD 026A A
1347                          ;
1348                          ;**********************************************
1349                          ;*              (NUMBER), NUMBER, -FIND        *
1350                          ;**********************************************
1351                          ;
1352      06CE 8828 A              HEAD     ORD,8,LONG,'('/256
1353      06CF 4E55 A              .WORD    'NU','MB','ER',')'+EVEN,WORD-4
          06D0 4D42 A
          06D1 4552 A
          06D2 A920 A
          06D3 06A4 A
1354      06D4 0342 A    PNUMB:    .WORD    DOCOL
1355      06D5 042B A    PNUMB1:   .WORD    ONEP,DUP,TOR,CAT,BASE,AT,DIGIT,ZBRAN
          06D6 02DD A
          06D7 027B A
          06D8 0311 A
          06D9 040D A
          06DA 030B A
          06DB 0166 A
          06DC 0124 A
1356      06DD 0016 A              .WORD    PNUMB3-.,SWAP,BASE,AT,USTAR
          06DE 02D5 A
          06DF 040D A
          06E0 030B A
          06E1 0213 A
1357      06E2 02D0 A              .WORD    DROP,ROT,BASE,AT,USTAR
          06E3 046A A
          06E4 040D A
          06E5 030B A
          06E6 0213 A
1358      06E7 02A7 A              .WORD    DPLUS,DPL,AT,ONEP,ZBRAN
          06E8 0412 A
          06E9 030B A
          06EA 042B A
          06EB 0124 A
1359      06EC 0004 A              .WORD    PNUMB2-.,ONE,DPL,PSTORE
          06ED 037A A
          06EE 0412 A
          06EF 02E3 A
1360      06F0 0283 A    PNUMB2:   .WORD    FROMR,BRAN
          06F1 011B A
1361      06F2 FFE3 A              .WORD    PNUMB1-.
1362      06F3 0283 A    PNUMB3:   .WORD    FROMR,SEMIS
```

```
       06F4 026A A
1363                        ;
1364                        ;    : NUMBER   BYTE  0  0  ROT  DUP  1+  C@
1365                        ;             2D  =   DUP  >R  +  -1
1366                        ;             BEGIN  DPL  !  (NUMBER)  DUP  C@  BL  -
1367                        ;             WHILE  DUP  C@  2E  -  0  ?ERROR  0  REPEAT
1368                        ;             DROP  R>  IF  DMINUS  ENDIF  ;
1369                        ;
1370   06F5 864E A              HEAD     ORD,6,LONG,'N'/256
1371   06F6 554D A              .WORD    'UM','BE','R'+EVEN,PNUMB-6
       06F7 4245 A
       06F8 D220 A
       06F9 06CE A
1372   06FA 0342 A    NUMB:    .WORD    DOCOL,BYTE,ZERO,ZERO
       06FB 02FD A
       06FC 0376 A
       06FD 0376 A
1373   06FE 046A A              .WORD    ROT,DUP,ONEP,CAT,LIT
       06FF 02DD A
       0700 042B A
       0701 0311 A
       0702 0103 A
1374   0703 002D A              .WORD    '-'/256,EQUAL,DUP,TOR,PLUS,LIT,-1
       0704 0457 A
       0705 02DD A
       0706 027B A
       0707 029F A
       0708 0103 A
       0709 FFFF A
1375   070A 0412 A    NUMB1:   .WORD    DPL,STORE,PNUMB,DUP,CAT,BL,SUB,ZBRAN
       070B 031D A
       070C 06D4 A
       070D 02DD A
       070E 0311 A
       070F 0387 A
       0710 0450 A
       0711 0124 A
1376   0712 000B A              .WORD    NUMB2-.,DUP,CAT,LIT,'.'/256
       0713 02DD A
       0714 0311 A
       0715 0103 A
       0716 002E A
1377   0717 0450 A              .WORD    SUB,ZERO,QERROR,ZERO,BRAN
       0718 0376 A
       0719 04D6 A
       071A 0376 A
       071B 011B A
1378   071C FFEE A              .WORD    NUMB1-.
1379   071D 02DD A    NUMB2:   .WORD    DROP,FROMR,ZBRAN
       071E 0283 A
       071F 0124 A
1380   0720 0002 A              .WORD    NUMB3-.,DMINUS
       0721 02BD A
1381   0722 026A A    NUMB3:   .WORD    SEMIS
1382                        ;
```

```
1383 0723 852D A             HEAD      ORD,5,LONG,'-'/256
1384 0724 4649 A             .WORD     'FI','ND'+ODD,NUMB-5
     0725 4EC4 A
     0726 06F5 A
1385 0727 0342 A   DFIND:    .WORD     DOCOL,BL,WORD,HERE,CONT,AT
     0728 0387 A
     0729 06A8 A
     072A 043A A
     072B 03FA A
     072C 030B A
1386 072D 030B A             .WORD     AT,PFIND,DUP,ZEQU,ZBRAN
     072E 017D A
     072F 02DD A
     0730 028F A
     0731 0124 A
1387 0732 0005 A             .WORD     DFIND1-.,DROP,HERE,LATEST,PFIND
     0733 02D0 A
     0734 043A A
     0735 049B A
     0736 017D A
1388 0737 026A A   DFIND1:   .WORD     SEMIS
1389               ;
1390               ;************************************************
1391               ;*                 ERROR HANDLER                *
1392               ;************************************************
1393               ;
1394                          .FORM     STRING,8,8
1395               ;
1396 0738 8728 A             HEAD      ORD,7,LONG,'('/256
1397 0739 4142 A             .WORD     'AB','OR','T)'+ODD,DFIND-4
     073A 4F52 A
     073B 54A9 A
     073C 0723 A
1398 073D 0342 A   PABORT:   .WORD     DOCOL,ABORT,SEMIS
     073E 0874 A
     073F 026A A
1399               ;
1400 0740 8545 A             HEAD      ORD,5,LONG,'E'/256
1401 0741 5252 A             .WORD     'RR','OR'+ODD,PABORT-5
     0742 4FD2 A
     0743 0738 A
1402 0744 0342 A   ERROR:    .WORD     DOCOL,WARN,AT,ZLESS,ZBRAN
     0745 03C5 A
     0746 030B A
     0747 0297 A
     0748 0124 A
1403 0749 0002 A             .WORD     ERROR1-.,PABORT
     074A 073D A
1404 074B 043A A   ERROR1:   .WORD     HERE,COUNT,TYPE,PDOTQ
     074C 058E A
     074D 0599 A
     074E 05CA A
1405 074F 0420 A             STRING    4,' '/256
1406 0750 203F A             .ASCII    ' ? '
     0751 2020 A
```

```
1407 0752 0A05 A              .WORD    MESS,SPSTOR,IN,AT
     0753 025B A
     0754 03E2 A
     0755 030B A
1408 0756 03DD A              .WORD    BLK,AT,QUIT,SEMIS
     0757 030B A
     0758 085C A
     0759 026A A
1409                  ;    : ID.   PAD  010  5F5F  FILL  DUP  PFA  LFA
1410                  ;          OVER  -   PAD  SWAP  MOVE  PAD  COUNT
1411                  ;          01F   AND  TYPE  SPACE  ;
1412                  ;
1413                  ;
1414 075A 8349 A              HEAD     ORD,3,LONG,'I'/256
1415 075B 44AE A              .WORD    'D.'+ODD,ERROR-4
     075C 0740 A
1416 075D 0342 A  IDDOT:      .WORD    DOCOL,PAD,LIT,0010,LIT,05F5F
     075E 0686 A
     075F 0103 A
     0760 0010 A
     0761 0103 A
     0762 5F5F A
1417 0763 0658 A              .WORD    FILL,DUP,PFA,LFA,OVER,SUB
     0764 02DD A
     0765 04C0 A
     0766 04A3 A
     0767 02C9 A
     0768 0450 A
1418 0769 0686 A              .WORD    PAD,SWAP,MOVE,PAD,COUNT
     076A 02D5 A
     076B 0201 A
     076C 0686 A
     076D 058E A
1419 076E 0103 A              .WORD    LIT,001F,AND,TYPE,SPACE,SEMIS
     076F 001F A
     0770 023F A
     0771 0599 A
     0772 0475 A
     0773 026A A
1420                  ;
1421                  ;*************************************************
1422                  ;*                      CREATE                   *
1423                  ;*************************************************
1424                  ;
1425                  ;    : CREATE  SP@  HERE  50  +  <  2  ?ERROR  -FIND
1426                  ;             IF  DROP  NFA  ID.  4  MESSAGE  SPACE
1427                  ;             ENDIF  HERE  DUP  BYTE  DUP  C@
1428                  ;             WIDTH  @  MIN  DUP  CELL  1+  ALLOT
1429                  ;             OVER  A0  TOGGLE  +  80  TOGGLE
1430                  ;             LATEST  ,  CURRENT  @  !
1431                  ;             HERE  1+  ,  ;
1432                  ;
1433 0774 8643 A              HEAD     ORD,6,LONG,'C'/256
1434 0775 5245 A              .WORD    'RE','AT','E'+EVEN,IDDOT-3
     0776 4154 A
```

```
            0777 C520 A
            0778 075A A
1435  0779 0342 A    CREATE: .WORD      DOCOL,SPAT,HERE,LIT,0050,PLUS
            077A 0255 A
            077B 043A A
            077C 0103 A
            077D 0050 A
            077E 029F A
1436  077F 045D A            .WORD      LESS,TWO,QERROR,DFIND,ZBRAN
            0780 037E A
            0781 04D6 A
            0782 0727 A
            0783 0124 A
1437  0784 0008 A            .WORD      CREAT1-.,DROP,NFA,IDDOT
            0785 02D0 A
            0786 04B1 A
            0787 075D A
1438  0788 0103 A            .WORD      LIT,4,MESS,SPACE.
            0789 0004 A
            078A 0A05 A
            078B 0475 A
1439  078C 043A A    CREAT1: .WORD      HERE,DUP,BYTE,DUP,CAT,WIDTH,AT
            078D 02DD A
            078E 02FD A
            078F 02DD A
            0790 0311 A
            0791 03BE A
            0792 030B A
1440  0793 08CF A            .WORD      MIN,DUP,CELL,ONEP,ALLOT,OVER
            0794 02DD A
            0795 0305 A
            0796 042B A
            0797 0442 A
            0798 02C9 A
1441  0799 0103 A            .WORD      LIT,00A0,TOGGLE,PLUS,LIT,0080
            079A 00A0 A
            079B 02ED A
            079C 029F A
            079D 0103 A
            079E 0080 A
1442  079F 02ED A            .WORD      TOGGLE,LATEST,COMMA,CURR,AT
            07A0 049B A
            07A1 0448 A
            07A2 0401 A
            07A3 030B A
1443  07A4 031D A            .WORD      STORE,HERE,ONEP,COMMA,SEMIS
            07A5 043A A
            07A6 042B A
            07A7 0448 A
            07A8 026A A
1444                  ;
1445                  ;*******************************************
1446                  ;*        [COMPILE], LITERAL, DLITERAL     *
1447                  ;*******************************************
1448                  ;
```

```
1449 07A9 C95B A          HEAD     IMM,9,LONG,'['/256
1450 07AA 434F A          .WORD    'CO','MP','IL','E]'+ODD,CREATE-5
     07AB 4D50 A
     07AC 494C A
     07AD 45DD A
     07AE 0774 A
1451 07AF 0342 A  BCOMP:  .WORD    DOCOL,DFIND,ZEQU,ZERO,QERROR
     07B0 0727 A
     07B1 028F A
     07B2 0376 A
     07B3 04D6 A
1452 07B4 02D0 A          .WORD    DROP,CFA,COMMA,SEMIS
     07B5 04AA A
     07B6 0448 A
     07B7 026A A
1453              ;
1454 07B8 C74C A          HEAD     IMM,7,LONG,'L'/256
1455 07B9 4954 A          .WORD    'IT','ER','AL'+ODD,BCOMP-6
     07BA 4552 A
     07BB 41CC A
     07BC 07A9 A
1456 07BD 0342 A  LITER:  .WORD    DOCOL,STATE,AT,ZBRAN
     07BE 0 D7 A
     07BF 030B A
     07C0 0124 A
1457 07C1 0004 A          .WORD    LITER1-.,COMPIL,LIT,COMMA
     07C2 0521 A
     07C3 0103 A
     07C4 0448 A
1458 07C5 026A A  LITER1: .WORD    SEMIS
1459              ;
1460 07C6 C844 A          HEAD     IMM,8,LONG,'D'/256
1461 07C7 4C49 A          .WORD    'LI','TE','RA','L'+EVEN,LITER-5
     07C8 5445 A
     07C9 5241 A
     07CA CC20 A
     07CB 07B8 A
1462 07CC 0342 A  DLITER: .WORD    DOCOL,STATE,AT,ZBRAN
     07CD 0407 A
     07CE 030B A
     07CF 0124 A
1463 07D0 0004 A          .WORD    DLITE1-.,SWAP,LITER,LITER
     07D1 02D5 A
     07D2 07BD A
     07D3 07BD A
1464 07D4 026A A  DLITE1: .WORD    SEMIS
1465              ;
1466              ;   : ?STACK   SO  @  SP@  <  L: ?ERROR
1467              ;              SP@  HERE  42  +  <  7  ?ERROR  ;
1468              ;
1469 07D5 863F A          HEAD     ORD,6,LONG,'?'/256
1470 07D6 5354 A          .WORD    'ST','AC','K'+EVEN,DLITER-6
     07D7 4143 A
     07D8 CB20 A
     07D9 07C6 A
```

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1471 07DA 0342 A   QSTACK: .WORD    DOCOL,SZERO,AT,SPAT,LESS
     07DB 03AE A
     07DC 030B A
     07DD 0255 A
     07DE 045D A
1472 07DF 037A A           .WORD    ONE,QERROR,SPAT,HERE,LIT,0042
     07E0 04D6 A
     07E1 0255 A
     07E2 043A A
     07E3 0103 A
     07E4 0042 A
1473 07E5 029F A           .WORD    PLUS,LESS,LIT,7,QERROR,SEMIS
     07E6 045D A
     07E7 0103 A
     07E8 0007 A
     07E9 04D6 A
     07EA 026A A
1474                ;
1475                ;*************************************************
1476                ;*                   INTERPRET                  *
1477                ;*************************************************
1478                ;
1479 07EB 8949 A           HEAD     ORD,9,LONG,'I'/256
1480 07EC 4E54 A           .WORD    'NT','ER','PR','ET'+ODD,QSTACK-5
     07ED 4552 A
     07EE 5052 A
     07EF 45D4 A
     07F0 07D5 A
1481 07F1 0342 A   INTER:  .WORD    DOCOL
1482 07F2 0727 A   INTER1: .WORD    DFIND,ZBRAN
     07F3 0124 A
1483 07F4 000F A           .WORD    INTER4-.,STATE,AT,LESS,ZBRAN
     07F5 0407 A
     07F6 030B A
     07F7 045D A
     07F8 0124 A
1484 07F9 0005 A           .WORD    INTER2-.,CFA,COMMA,BRAN
     07FA 04AA A
     07FB 0448 A
     07FC 011B A
1485 07FD 0003 A           .WORD    INTER3-.
1486 07FE 04AA A   INTER2: .WORD    CFA,EXEC
     07FF 0112 A
1487 0800 07DA A   INTER3: .WORD    QSTACK,BRAN
     0801 011B A
1488 0802 000E A           .WORD    INTER7-.
1489 0803 043A A   INTER4: .WORD    HERE,NUMB,DPL,AT,ONEP,ZBRAN
     0804 06FA A
     0805 0412 A
     0806 030B A
     0807 042B A
     0808 0124 A
1490 0809 0004 A           .WORD    INTER5-.,DLITER,BRAN
     080A 07CC A
     080B 011B A
```

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1491  080C 0003 A                    .WORD    INTER6-.
1492  080D 02D0 A    INTER5:  .WORD    DROP,LITER
      080E 07BD A
1493  080F 07DA A    INTER6:  .WORD    QSTACK
1494  0810 011B A    INTER7:  .WORD    BRAN
1495  0811 FFE1 A                    .WORD    INTER1-.,SEMIS
      0812 026A A
1496                 ;
1497                 ;***************************************************
1498                 ;*    IMMEDIATE, VOCABULARY, DEFINITIONS, FORTH, (  *
1499                 ;***************************************************
1500                 ;
1501                 ;     : IMMEDIATE    LATEST   BYTE   40   TOGGLE   ;
1502                 ;
1503  0813 8949 A            HEAD     ORD,9,LONG,'I'/256
1504  0814 4D4D A            .WORD    'MM','ED','IA','TE'+ODD,INTER-6
      0815 4544 A
      0816 4941 A
      0817 54C5 A
      0818 07EB A
1505  0819 0342 A    IMMED:   .WORD    DOCOL,LATEST,BYTE
      081A 049B A
      081B 02FD A
1506  081C 0103 A            .WORD    LIT,0040,TOGGLE,SEMIS
      081D 0040 A
      081E 02ED A
      081F 026A A
1507                 ;
1508                 ;     : VOCABULARY   <BUILDS  81A0  ,   CURRENT  @
1509                 ;          CFA  ,  HERE  VOC-LINK  @  ,  VOC-LINK  !
1510                 ;          DOES>  1+  CONTEXT  !  ;
1511                 ;
1512  0820 8A56 A            HEAD     ORD,10,LONG,'V'/256
1513  0821 4F43 A            .WORD    'OC','AB','UL','AR','Y'+EVEN,IMMED-6
      0822 4142 A
      0823 554C A
      0824 4152 A
      0825 D920 A
      0826 0813 A
1514  0827 0342 A    VOCAB:   .WORD    DOCOL,BUILDS,LIT,081A0,COMMA
      0828 0575 A
      0829 0103 A
      082A 81A0 A
      082B 0448 A
1515  082C 0401 A            .WORD    CURR,AT,CFA,COMMA,HERE,VOCL
      082D 030B A
      082E 04AA A
      082F 0448 A
      0830 043A A
      0831 03D8 A
1516  0832 030B A            .WORD    AT,COMMA,VOCL,STORE,DOES
      0833 0448 A
      0834 03D8 A
      0835 031D A
      0836 057D A
```

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1517  0837 042B  A    DOVOC:   .WORD   ONEP,CONT,STORE,SEMIS
      0838 03FA  A
      0839 031D  A
      083A 026A  A
1518                   ;
1519  083B C546  A             HEAD    IMM,5,LONG,'F'/256
1520  083C 4F52  A             .WORD   'OR','TH'+ODD,VOCAB-7
      083D 54C8  A
      083E 0820  A
1521  083F 0583  A    FORTH:   .WORD   DODOES,DOVOC,081A0,TASK-4,0
      0840 0837  A
      0841 81A0  A
      0842 0C65  A
      0843 0000  A
1522                   ;
1523  0844 8B44  A             HEAD    ORD,11,LONG,'D'/256
1524  0845 4546  A             .WORD   'EF','IN','IT','IO','NS'+ODD,FORTH-4
      0846 494E  A
      0847 4954  A
      0848 494F  A
      0849 4ED3  A
      084A 083B  A
1525  084B 0342  A    DEFIN:   .WORD   DOCOL,CONT,AT,CURR,STORE,SEMIS
      084C 03FA  A
      084D 030B  A
      084E 0401  A
      084F 031D  A
      0850 026A  A
1526                   ;
1527  0851 C1A8  A             HEAD    IMM,1,SHORT,'('/256
1528  0852 0844  A             .WORD   DEFIN-7
1529  0853 0342  A    PAREN:   .WORD   DOCOL,LIT,')'/256,WORD,SEMIS
      0854 0103  A
      0855 0029  A
      0856 06A8  A
      0857 026A  A
1530                   ;
1531                   ;*****************************************************
1532                   ;*                  QUIT, ABORT                      *
1533                   ;*****************************************************
1534                   ;
1535  0858 8451  A             HEAD    ORD,4,LONG,'Q'/256
1536  0859 5549  A             .WORD   'UI','T'+EVEN,PAREN-2
      085A D420  A
      085B 0851  A
1537  085C 0342  A    QUIT:    .WORD   DOCOL,ZERO,BLK,STORE,LBRAC
      085D 0376  A
      085E 03DD  A
      085F 031D  A
      0860 052C  A
1538  0861 0262  A    QUIT1:   .WORD   RPSTOR,CR,QUERY,INTER
      0862 01FC  A
      0863 062D  A
      0864 07F1  A
1539  0865 0407  A             .WORD   STATE,AT,ZEQU,ZBRAN
```

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          0866 030B A
          0867 028F A
          0868 0124 A
1540 0869 0004 A                .WORD    QUIT2-.,PDOTQ
          086A 05CA A
1541 086B 0320 A                STRING   3,' '/256
1542 086C 4F4B A                .ASCII   'OK'
1543 086D 011B A    QUIT2:      .WORD    BRAN
1544 086E FFF3 A                .WORD    QUIT1-.,SEMIS
          086F 026A A
1545                ;
1546                ;   : ABORT  SP! DECIMAL  DR0  CR
1547                ;             ." PACE FORTH  V 4.0"  [COMPILE]
1548                ;            FORTH  DEFINITIONS  QUIT  ;
1549                ;
1550 0870 8541 A                HEAD     ORD,5,LONG,'A'/256
1551 0871 424F A                .WORD    'BO','RT'+ODD,QUIT-4
          0872 52D4 A
          0873 0858 A
1552 0874 0342 A    ABORT:      .WORD    DOCOL,SPSTOR,DEC,DRONE,CR,PDOTQ
          0875 025B A
          0876 0553 A
          0877 097F A
          0878 01FC A
          0879 05CA A
1553 087A 1150 A                STRING   17,'P'/256
1554 087B 4143 A                .ASCII   'ACE FORTH  V 4.0'
          087C 4520 A
          087D 464F A
          087E 5254 A
          087F 4820 A
          0880 2056 A
          0881 2034 A
          0882 2E30 A
1555 0883 083F A                .WORD    FORTH,DEFIN,QUIT,SEMIS
          0884 084B A
          0885 085C A
          0886 026A A
1556                ;
1557                ;****************************************************
1558                ;*                   COLD START                    *
1559                ;****************************************************
1560                ;
1561 0887 8443 A                HEAD     ORD,4,LONG,'C'/256
1562 0888 4F4C A                .WORD    'OL','D'+EVEN,ABORT-4
          0889 C420 A
          088A 0870 A
1563 088B 088C A    COLD:       .WORD    .+1
1564 088C 1423 A    CENT:       JSR      INIT            ; (INSTALL. DEPEND.)
1565 088D C912 A                LD       X,ORGPTR        ; PTR TO STARTUP LITS
1566 088E C206 A                LD       0,06(X)         ; INITIALIZE
1567 088F D1B2 A                ST       0,FORTH+3       ;   FORTH VOCABULARY
1568 0890 5108 A                LI       1,08            ; INIT 8 USER VARS
1569 0891 1902 A                JMP      LDUP
1570 0892 5105 A    WENT:       LI       1,05            ; INIT 5 USER VARS
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1571  0893 C90C A              LD      X,ORGPTR        ; PTR TO STARTUP LITS
1572  0894 CE08 A      LDUP:   LD      Y,08(X)         ; INITIALIZE
1573  0895 DC22 A              ST      Y,UP            ;  USER POINTER
1574  0896 C209 A      LDUVS:  LD      0,09(X)         ; MOVE FROM LITERAL
1575  0897 D303 A              ST      0,03(Y)         ;  AREA TO USER AREA
1576  0898 7A01 A              AISZ    X,1
1577  0899 7B01 A              AISZ    Y,1
1578  089A 79FF A              AISZ    1,-1
1579  089B 19FA A              JMP     LDUVS
1580  089C C502 A              LD      IP,IP0          ; POINT IP TO ABORT
1581  089D 9900 A              JMP     @START          ; START AT RP!
1582  089E 0263 A      START:  .WORD   RPSTOR+1
1583  089F 0875 A      IP0:    .WORD   ABORT+1
1584  08A0 0010 A      ORGPTR: .WORD   ORIG            ; START OF LITERALS
1585                           ;
1586                           ;*****************************************************
1587                           ;*                    MATH UTILITY                   *
1588                           ;*****************************************************
1589                           ;
1590  08A1 8453 A              HEAD    ORD,4,LONG,'S'/256
1591  08A2 2D3E A              .WORD   '->','D'+EVEN,COLD-4
      08A3 C420 A
      08A4 0887 A
1592  08A5 08A6 A      STOD:   .WORD   .+1
1593  08A6 5000 A              LI      0,0
1594  08A7 9F00 A              SKG     0,0(SP)
1595  08A8 98F9 I              JMP     PUSH
1596  08A9 50FF A              LI      0,-1
1597  08AA 98F9 I              JMP     PUSH
1598                           ;
1599  08AB 822B A              HEAD    ORD,2,LONG,'+'/256
1600  08AC AD20 A              .WORD   '-'+EVEN,STOD-4
      08AD 08A1 A
1601  08AE 0342 A      PMI:    .WORD   DOCOL,ZLESS,ZBRAN
      08AF 0297 A
      08B0 0124 A
1602  08B1 0002 A              .WORD   PMI1-.,MINUS
      08B2 02B4 A
1603  08B3 026A A      PMI1:   .WORD   SEMIS
1604                           ;
1605  08B4 8344 A              HEAD    ORD,3,LONG,'D'/256
1606  08B5 2BAD A              .WORD   '+-'+ODD,PMI-3
      08B6 08AB A
1607  08B7 0342 A      DPMI:   .WORD   DOCOL,ZLESS,ZBRAN
      08B8 0297 A
      08B9 0124 A
1608  08BA 0002 A              .WORD   DPMI1-.,DMINUS
      08BB 02BD A
1609  08BC 026A A      DPMI1:  .WORD   SEMIS
1610                           ;
1611  08BD 8341 A              HEAD    ORD,3,LONG,'A'/256
1612  08BE 42D3 A              .WORD   'BS'+ODD,DPMI-3
      08BF 08B4 A
1613  08C0 0342 A      ABS:    .WORD   DOCOL,DUP,PMI,SEMIS
      08C1 02DD A
```

```
        08C2 08AE A
        08C3 026A A
1614                    ;
1615 08C4 8444 A              HEAD     ORD,4,LONG,'D'/256
1616 08C5 4142 A              .WORD    'AB','S'+EVEN,ABS-3
     08C6 D320 A
     08C7 08BD A
1617 08C8 0342 A    DABS:     .WORD    DOCOL,DUP,DPMI,SEMIS
     08C9 02DD A
     08CA 08B7 A
     08CB 026A A
1618                    ;
1619 08CC 834D A              HEAD     ORD,3,LONG,'M'/256
1620 08CD 49CE A              .WORD    'IN'+ODD,DABS-4
     08CE 08C4 A
1621 08CF 08D0 A    MIN:      .WORD    .+1
1622 08D0 C300 A              LD       0,0(SP)         ; GET BOTTOM
1623 08D1 9F01 A              SKG      0,1(SP)         ; COMPARE WITH SECOND
1624 08D2 98F6 I              JMP      BIN             ; IF BOTTOM <= SECOND
1625 08D3 98FA I              JMP      POP             ; IF BOTTOM > SECOND
1626                    ;
1627 08D4 834D A              HEAD     ORD,3,LONG,'M'/256
1628 08D5 41D8 A              .WORD    'AX'+ODD,MIN-3
     08D6 08CC A
1629 08D7 08D8 A    MAX:      .WORD    .+1
1630 08D8 C300 A              LD       0,0(SP)         ; GET BOTTOM
1631 08D9 9F01 A              SKG      0,1(SP)         ; COMPARE WITH SECOND
1632 08DA 98FA I              JMP      POP             ; IF BOTTOM <= SECOND
1633 08DB 98F6 I              JMP      BIN             ; IF BOTTOM > SECOND
1634                    ;
1635                    ;**************************************************
1636                    ;                    SIGNED MATH
1637                    ;**************************************************
1638                    ;
1639 08DC 824D A              HEAD     ORD,2,LONG,'M'/256
1640 08DD AA20 A              .WORD    '*'+EVEN,MAX-3
     08DE 08D4 A
1641 08DF 0342 A    MSTAR:    .WORD    DOCOL,OVER,OVER,XOR,TOR
     08E0 02C9 A
     08E1 02C9 A
     08E2 024D A
     08E3 027B A
1642 08E4 08C0 A              .WORD    ABS,SWAP,ABS,USTAR
     08E5 02D5 A
     08E6 08C0 A
     08E7 0213 A
1643 08E8 0283 A              .WORD    FROMR,DPMI,SEMIS
     08E9 08B7 A
     08EA 026A A
1644                    ;
1645 08EB 824D A              HEAD     ORD,2,LONG,'M'/256
1646 08EC AF20 A              .WORD    '/'+EVEN,MSTAR-3
     08ED 08DC A
1647 08EE 0342 A    MSLASH:   .WORD    DOCOL,OVER,TOR,TOR
     08EF 02C9 A
```

```
          08F0 027B A
          08F1 027B A
     1648 08F2 08C8 A                .WORD    DABS,R,ABS,USLASH
          08F3 0289 A
          08F4 08C0 A
          08F5 0227 A
     1649 08F6 0283 A                .WORD    FROMR,R,XOR,PMI,SWAP
          08F7 0289 A
          08F8 024D A
          08F9 08AE A
          08FA 02D5 A
     1650 08FB 0283 A                .WORD    FROMR,PMI,SWAP,SEMIS
          08FC 08AE A
          08FD 02D5 A
          08FE 026A A
     1651                  ;
     1652 08FF 81AA A                HEAD     ORD,1,SHORT,'*'/256
     1653 0900 08EB A                .WORD    MSLASH-3
     1654 0901 0342 A     STAR:      .WORD    DOCOL,USTAR,DROP,SEMIS
          0902 0213 A
          0903 02D0 A
          0904 026A A
     1655                  ;
     1656 0905 842F A                HEAD     ORD,4,LONG,'/'/256
     1657 0906 4D4F A                .WORD    'MO','D'+EVEN,STAR-2
          0907 C420 A
          0908 08FF A
     1658 0909 0342 A     SLMOD:     .WORD    DOCOL,TOR,STOD,FROMR,MSLASH,SEMIS
          090A 027B A
          090B 08A5 A
          090C 0283 A
          090D 08EE A
          090E 026A A
     1659                  ;
     1660 090F 81AF A                HEAD     ORD,1,SHORT,'/'/256
     1661 0910 0905 A                .WORD    SLMOD-4
     1662 0911 0342 A     SLASH:     .WORD    DOCOL,SLMOD,SWAP,DROP,SEMIS
          0912 0909 A
          0913 02D5 A
          0914 02D0 A
          0915 026A A
     1663                  ;
     1664 0916 834D A                HEAD     ORD,3,LONG,'M'/256
     1665 0917 4FC4 A                .WORD    'OD'+ODD,SLASH-2
          0918 090F A
     1666 0919 0342 A     MOD:       .WORD    DOCOL,SLMOD,DROP,SEMIS
          091A 0909 A
          091B 02D0 A
          091C 026A A
     1667                  ;
     1668 091D 852A A                HEAD     ORD,5,LONG,'*'/256
     1669 091E 2F4D A                .WORD    '/M','OD'+ODD,MOD-3
          091F 4FC4 A
          0920 0916 A
     1670 0921 0342 A     SSMOD:     .WORD    DOCOL,TOR,MSTAR,FROMR,MSLASH,SEMIS
```

```
         0922 027B  A
         0923 08DF  A
         0924 0283  A
         0925 08EE  A
         0926 026A  A
 1671                        ;
 1672 0927 822A  A                HEAD    ORD,2,LONG,'*'/256
 1673 0928 AF20  A                .WORD   '/'+EVEN,SSMOD-4
      0929 091D  A
 1674 092A 0342  A  SSLASH: .WORD  DOCOL,SSMOD,SWAP,DROP,SEMIS
      092B 0921  A
      092C 02D5  A
      092D 02D0  A
      092E 026A  A
 1675                        ;
 1676 092F 854D  A                HEAD    ORD,5,LONG,'M'/256
 1677 0930 2F4D  A                .WORD   '/M','OD'+ODD,SSLASH-3
      0931 4FC4  A
      0932 0927  A
 1678 0933 0342  A  MSMOD:  .WORD  DOCOL,TOR,ZERO,R,USLASH,FROMR
      0934 027B  A
      0935 0376  A
      0936 0289  A
      0937 0227  A
      0938 0283  A
 1679 0939 02D5  A         .WORD  SWAP,TOR,USLASH,FROMR,SEMIS
      093A 027B  A
      093B 0227  A
      093C 0283  A
      093D 026A  A
 1680                        ;
 1681                        ;*********************************************
 1682                        ;*           DISC UTILITY, GENERAL USE       *
 1683                        ;*********************************************
 1684                        ;
 1685 093E 8355  A                HEAD    ORD,3,LONG,'U'/256
 1686 093F 53C5  A                .WORD   'SE'+ODD,MSMOD-4
      0940 092F  A
 1687 0941 0367  A  USE:    .WORD  DOVAR,BUFFS
      0942 1DF0  A
 1688                        ;
 1689 0943 8450  A                HEAD    ORD,4,LONG,'P'/256
 1690 0944 5245  A                .WORD   'RE','V'+EVEN,USE-3
      0945 D620  A
      0946 093E  A
 1691 0947 0367  A  PREV:   .WORD  DOVAR,BUFFS
      0948 1DF0  A
 1692                        ;
 1693 0949 842B  A                HEAD    ORD,4,LONG,'+'/256
 1694 094A 4255  A                .WORD   'BU','F'+EVEN,PREV-4
      094B C620  A
      094C 0943  A
 1695 094D 0342  A  PBUF:   .WORD  DOCOL,LIT,BLKSIZ/2+2,PLUS
      094E 0103  A
      094F 0042  A
```

```
          0950 029F A
1696 0951 02DD A                   .WORD     DUP,LIMIT,EQUAL,ZBRAN
     0952 0393 A
     0953 0457 A
     0954 0124 A
1697 0955 0003 A                   .WORD     PBUF1-.,DROP,FIRST
     0956 02D0 A
     0957 038D A
1698 0958 02DD A       PBUF1:      .WORD     DUP,PREV,AT,SUB,SEMIS
     0959 0947 A
     095A 030B A
     095B 0450 A
     095C 026A A
1699                   ;
1700 095D 8655 A                   HEAD      ORD,6,LONG,'U'/256
1701 095E 5044 A                   .WORD     'PD','AT','E'+EVEN,PBUF-4
     095F 4154 A
     0960 C520 A
     0961 0949 A
1702 0962 0342 A       UPDATE:     .WORD     DOCOL,PREV,AT,AT,LIT,08000
     0963 0947 A
     0964 030B A
     0965 030B A
     0966 0103 A
     0967 8000 A
1703 0968 0246 A                   .WORD     OR,PREV,AT,STORE,SEMIS
     0969 0947 A
     096A 030B A
     096B 031D A
     096C 026A A
1704                   ;
1705 096D 8D45 A                   HEAD      ORD,13,LONG,'E'/256
1706 096E 4D50 A                   .WORD     'MP','TY','-B','UF'
     096F 5459 A
     0970 2D42 A
     0971 5546 A
1707 0972 4645 A                   .WORD     'FE','RS'+ODD,UPDATE-5
     0973 52D3 A
     0974 095D A
1708 0975 0342 A       MTBUF:      .WORD     DOCOL,FIRST,LIMIT
     0976 038D A
     0977 0393 A
1709 0978 02C9 A                   .WORD     OVER,SUB,ERASE,SEMIS
     0979 0450 A
     097A 0668 A
     097B 026A A
1710                   ;
1711 097C 8344 A                   HEAD      ORD,3,LONG,'D'/256
1712 097D 52B1 A                   .WORD     'R1'+ODD,MTBUF-8
     097E 096D A
1713 097F 0342 A       DRONE:      .WORD     DOCOL,ZERO,OFFSET,STORE,SEMIS
     0980 0376 A
     0981 03F3 A
     0982 031D A
     0983 026A A
```

```
1714                        ;
1715  0984  8344  A                   HEAD      ORD,3,LONG,'D'/256
1716  0985  52B2  A                   .WORD     'R2'+ODD,DRONE-3
      0986  097C  A
1717  0987  0342  A         DRTWO:    .WORD     DOCOL,LIT,2000
      0988  0103  A
      0989  07D0  A
1718  098A  03F3  A                   .WORD     OFFSET,STORE,SEMIS
      098B  031D  A
      098C  026A  A
1719                        ;
1720                        ;**********************************************
1721                        ;*                    BUFFER                  *
1722                        ;**********************************************
l723                        ;
l724                        ;    : BUFFER    USE   @   DUP   >R  BEGIN  +BUF  UNTIL
l725                        ;          USE   !   R   @   0<   IF   R   1+   R   @   7FFF
1726                        ;                           AND   0   R/W   ENDIF
1727                        ;          R   !   R   PREV   !   R>   1+   ;
1728                        ;
1729  098D  8642  A                   HEAD      ORD,6,LONG,'B'/256
1730  098E  5546  A                   .WORD     'UF','FE','R'+EVEN,DRTWO-3
      098F  4645  A
      0990  D220  A
      0991  0984  A
1731  0992  0342  A         BUFFER:   .WORD     DOCOL,USE,AT,DUP,TOR
      0993  0941  A
      0994  030B  A
      0995  02DD  A
      0996  027B  A
1732  0997  094D  A         BUFF1:    .WORD     PBUF,ZBRAN
      0998  0124  A
1733  0999  FFFE  A                   .WORD     BUFF1-.,USE,STORE
      099A  0941  A
      099B  031D  A
1734  099C  0289  A                   .WORD     R,AT,ZLESS,ZBRAN
      099D  030B  A
      099E  0297  A
      099F  0124  A
1735  09A0  000A  A                   .WORD     BUFF2-.,R,ONEP,R,AT
      09A1  0289  A
      09A2  042B  A
      09A3  0289  A
      09A4  030B  A
1736  09A5  0103  A                   .WORD     LIT,07FFF,AND,ZERO,RW
      09A6  7FFF  A
      09A7  023F  A
      09A8  0376  A
      09A9  0A63  A
1737  09AA  0289  A         BUFF2:    .WORD     R,STORE,R,PREV,STORE
      09AB  031D  A
      09AC  0289  A
      09AD  0947  A
      09AE  031D  A
1738  09AF  0283  A                   .WORD     FROMR,ONEP,SEMIS
```

```
          09B0 042B A
          09B1 026A A
1739                        ;
1740                        ;*******************************************
1741                        ;*                   BLOCK                 *
1742                        ;*******************************************
1743                        ;
1744                        ;   : BLOCK   OFFSET   @   +   >R
1745                        ;       PREV  @  DUP  @  R  -  DUP  +
1746                        ;       IF  BEGIN  +BUF  0=
1747                        ;           IF  DROP  R  BUFFER
1748                        ;           DUP  R  1  R/W  1  -  ENDIF
1749                        ;           DUP  @  R  -  DUP  +  0=  UNTIL
1750                        ;       DUP  PREV  !  ENDIF  R>  DROP  1+  ;
1751                        ;
1752 09B2 8542 A            HEAD      ORD,5,LONG,'B'/256
1753 09B3 4C4F A            .WORD     'LO','CK'+ODD,BUFFER-5
     09B4 43CB A
     09B5 098D A
1754 09B6 0342 A    BLOCK:  .WORD     DOCOL,OFFSET,AT,PLUS,TOR
     09B7 03F3 A
     09B8 030B A
     09B9 029F A
     09BA 027B A
1755 09BB 0947 A            .WORD     PREV,AT,DUP,AT,R
     09BC 030B A
     09BD 02DD A
     09BE 030B A
     09BF 0289 A
1756 09C0 0450 A            .WORD     SUB,DUP,PLUS,ZBRAN
     09C1 02DD A
     09C2 029F A
     09C3 0124 A
1757 09C4 001A A            .WORD     BLOCK3-.
1758 09C5 094D A    BLOCK1: .WORD     PBUF,ZEQU,ZBRAN
     09C6 028F A
     09C7 0124 A
1759 09C8 000A A            .WORD     BLOCK2-.,DROP,R,BUFFER
     09C9 02D0 A
     09CA 0289 A
     09CB 0992 A
1760 09CC 02DD A            .WORD     DUP,R,ONE,RW,ONE,SUB
     09CD 0289 A
     09CE 037A A
     09CF 0A63 A
     09D0 037A A
     09D1 0450 A
1761 09D2 02DD A    BLOCK2: .WORD     DUP,AT,R,SUB,DUP
     09D3 030B A
     09D4 0289 A
     09D5 0450 A
     09D6 02DD A
1762 09D7 029F A            .WORD     PLUS,ZEQU,ZBRAN
     09D8 028F A
     09D9 0124 A
```

```
1763  09DA FFEB A                 .WORD    BLOCK1-.,DUP,PREV,STORE
      09DB 02DD A
      09DC 0947 A
      09DD 031D A
1764  09DE 0283 A  BLOCK3: .WORD  FROMR,DROP,ONEP,SEMIS
      09DF 02D0 A
      09E0 042B A
      09E1 026A A
1765                      ;
1766                      ;************************************************
1767                      ;*              TEXT OUTPUT FORMATTING          *
1768                      ;************************************************
1769                      ;
1770                      ;   : (LINE)   >R   40  B/BUF  */MOD  R>   B/SCR  *
1771                      ;              +  BLOCK  BYTE  +  40  ;
1772                      ;
1773  09E2 8628 A                 HEAD     ORD,6,LONG,'('/256
1774  09E3 4C49 A                 .WORD    'LI','NE',')'+EVEN,BLOCK-4
      09E4 4E45 A
      09E5 A920 A
      09E6 09B2 A
1775  09E7 0342 A  PLINE:  .WORD  DOCOL,TOR,LIT,64,BBUF,SSMOD
      09E8 027B A
      09E9 0103 A
      09EA 0040 A
      09EB 0399 A
      09EC 0921 A
1776  09ED 0283 A         .WORD   FROMR,BSCR,STAR,PLUS,BLOCK
      09EE 039F A
      09EF 0901 A
      09F0 029F A
      09F1 09B6 A
1777  09F2 02FD A         .WORD   BYTE,PLUS,LIT,64,SEMIS
      09F3 029F A
      09F4 0103 A
      09F5 0040 A
      09F6 026A A
1778                      ;
1779  09F7 852E A                 HEAD     ORD,5,LONG,'.'/256
1780  09F8 4C49 A                 .WORD    'LI','NE'+ODD,PLINE-5
      09F9 4EC5 A
      09FA 09E2 A
1781  09FB 0342 A  DLINE:  .WORD  DOCOL,PLINE,DTRAIL,TYPE,SEMIS
      09FC 09E7 A
      09FD 05B0 A
      09FE 0599 A
      09FF 026A A
1782                      ;
1783  0A00 874D A                 HEAD     ORD,7,LONG,'M'/256
1784  0A01 4553 A                 .WORD    'ES','SA','GE'+ODD,DLINE-4
      0A02 5341 A
      0A03 47C5 A
      0A04 09F7 A
1785  0A05 0342 A  MESS:   .WORD  DOCOL,WARN,AT,ZBRAN
      0A06 03C5 A
```

```
           0A07 030B A
           0A08 0124 A
 1786 0A09 000E A              .WORD     MESS2-.,DDUP,ZBRAN
           0A0A 047D A
           0A0B 0124 A
 1787 0A0C 0009 A              .WORD     MESS1-.,LIT,4,OFFSET,AT
           0A0D 0103 A
           0A0E 0004 A
           0A0F 03F3 A
           0A10 030B A
 1788 0A11 039F A              .WORD     BSCR,SLASH,SUB,DLINE
           0A12 0911 A
           0A13 0450 A
           0A14 09FB A
 1789 0A15 011B A  MESS1:      .WORD     BRAN
 1790 0A16 0007 A              .WORD     MESS3-.
 1791 0A17 05CA A  MESS2:      .WORD     PDOTQ
 1792 0A18 064D A              STRING    6,'M'/256
 1793 0A19 5347 A              .ASCII    'SG , '
           0A1A 2023 A
           0A1B 2020 A
 1794 0A1C 0BD5 A              .WORD     DOT
 1795 0A1D 026A A  MESS3:      .WORD     SEMIS
 1796                          ;
 1797                          ;*************************************************
 1798                          ;*                     LOAD,  -->                *
 1799                          ;*************************************************
 1800                          ;
 1801 0A1E 844C A              HEAD      ORD,4,LONG,'L'/256
 1802 0A1F 4F41 A              .WORD     'OA','D'+EVEN,MESS-5
           0A20 C420 A
           0A21 0A00 A
 1803 0A22 0342 A  LOAD:       .WORD     DOCOL,BLK,AT,TOR,IN,AT,TOR
           0A23 03DD A
           0A24 030B A
           0A25 027B A
           0A26 03E2 A
           0A27 030B A
           0A28 027B A
 1804 0A29 0376 A              .WORD     ZERO,IN,STORE,BSCR,STAR,BLK,STORE
           0A2A 03E2 A
           0A2B 031D A
           0A2C 039F A
           0A2D 0901 A
           0A2E 03DD A
           0A2F 031D A
 1805 0A30 07F1 A              .WORD     INTER,FROMR,IN,STORE
           0A31 0283 A
           0A32 03E2 A
           0A33 031D A
 1806 0A34 0283 A              .WORD     FROMR,BLK,STORE,SEMIS
           0A35 03DD A
           0A36 031D A
           0A37 026A A
 1807                          ;
```

0A38 - 0A58

ARROW	0A3B	A
PEMIT	0A49	A
PKEY	0A4D	A
PQTERM	0A4F	A
PCR	0A53	A

```
1850  0A59  035C  A   HI:      .WORD    DOCON,HIBLK
      0A5A  3FC0  A
1851                   ;
1852  0A5B  824C  A            HEAD     ORD,2,LONG,'L'/256
1853  0A5C  CF20  A            .WORD    'O'+EVEN,HI-3
      0A5D  0A56  A
1854  0A5E  035C  A   LO:      .WORD    DOCON,LOBLK
      0A5F  2000  A
1855                   ;
1856                   ;  : R/W   >R  DUP  0<  6  ?ERROR  ( BLOCK, < 0 ? )
1857                   ;          B/BUF  CELL  *  LO  +   ( FWA OF BLOCK )
1858                   ;          DUP  HI  >  6  ?ERROR   ( TOO HIGH ? )
1859                   ;          R>  IF  SWAP  ENDIF     ( TO OR FROM ? )
1860                   ;          B/BUF  CELL  MOVE  ;    ( TRANSFER DATA )
1861                   ;
1862  0A60  8352  A            HEAD     ORD,3,LONG,'R'/256
1863  0A61  2FD7  A            .WORD    '/W'+ODD,LO-3
      0A62  0A5B  A
1864  0A63  0342  A   RW:      .WORD    DOCOL,TOR,DUP,ZLESS
      0A64  027B  A
      0A65  02DD  A
      0A66  0297  A
1865  0A67  0103  A            .WORD    LIT,6,QERROR,BBUF,CELL
      0A68  0006  A
      0A69  04D6  A
      0A6A  0399  A
      0A6B  0305  A
1866  0A6C  0901  A            .WORD    STAR,LO,PLUS,DUP,HI,GREAT
      0A6D  0A5E  A
      0A6E  029F  A
      0A6F  02DD  A
      0A70  0A59  A
      0A71  0463  A
1867  0A72  0103  A            .WORD    LIT,6,QERROR,FROMR,ZBRAN
      0A73  0006  A
      0A74  04D6  A
      0A75  0283  A
      0A76  0124  A
1868  0A77  0002  A            .WORD    RW1-.,SWAP
      0A78  02D5  A
1869  0A79  0399  A   RW1:     .WORD    BBUF,CELL,MOVE,SEMIS
      0A7A  0305  A
      0A7B  0201  A
      0A7C  026A  A
1870                   ;
1871                   ;*******************************************
1872                   ;*                  ', FORGET              *
1873                   ;*******************************************
1874                   ;
1875  0A7D  C1A7  A            HEAD     IMM,1,SHORT,''''/256
1876  0A7E  0A60  A            .WORD    RW-3
1877  0A7F  0342  A   TICK:    .WORD    DOCOL,DFIND,ZEQU,ZERO
      0A80  0727  A
      0A81  028F  A
      0A82  0376  A
```

```
1878 0A83 04D6 A                    .WORD    QERROR,DROP,LITER,SEMIS
     0A84 02D0 A
     0A85 07BD A
     0A86 026A A
1879                      ;
1880                      ;*********************************** (((((((((*****
1881                      ;   : FORGET    CURRENT  @  CONTEXT  @   ( IS VOCAB )
1882                      ;            -  18  ?ERROR            ( NON-AMBIGUOUS ? )
1883                      ;          [COMPILE]  '  NFA ( HD OF WORD TO FORGET )
1884                      ;          DUP  FENCE  @  <  15  ?ERROR  ( CMP FENCE )
1885                      ;          >R  VOC-LINK  @ ( START WITH LATEST VOCAB)
1886                      ;          BEGIN  R  OVER  <  ( FORGET ENTIRE VOCAB? )
1887                      ;          WHILE  [COMPILE]  FORTH  DEFINITIONS
1888                      ;               @  DUP  VOC-LINK !  ( UNLINK VOCAB )
1889                      ;          REPEAT
1890                      ;          BEGIN  DUP  2  -  ( START AT PHANTOM NAME )
1891                      ;              BEGIN  PFA  LFA  @  ( HEAD OF WORD )
1892                      ;                DUP  R  <  ( FORGETTING IT ? )
1893                      ;              UNTIL
1894                      ;              OVER  1  -  !  ( NEW HEAD OF VOCAB )
1895                      ;              @  -DUP  0=  ( END OF VOCAB LIST ? )
1896                      ;          UNTIL
1897                      ;          R>  DP  !  ;     ( NEW DICTIONARY POINTER )
1898                      ;
1899 0A87 8646 A         HEAD     ORD,6,LONG,'F'/256
1900 0A88 4F52 A         .WORD    'OR','GE','T'+EVEN,TICK-2
     0A89 4745 A
     0A8A D420 A
     0A8B 0A7D A
1901 0A8C 0342 A  FORGET: .WORD   DOCOL,CURR,AT,CONT,AT
     0A8D 0401 A
     0A8E 030B A
     0A8F 03FA A
     0A90 030B A
1902 0A91 0450 A         .WORD    SUB,LIT,0018,QERROR
     0A92 0103 A
     0A93 0018 A
     0A94 04D6 A
1903 0A95 0A7F A         .WORD    TICK,NFA,DUP,FENCE,AT,LESS
     0A96 04B1 A
     0A97 02DD A
     0A98 03CB A
     0A99 030B A
     0A9A 045D A
1904 0A9B 0103 A         .WORD    LIT,0015,QERROR,TOR,VOCL,AT
     0A9C 0015 A
     0A9D 04D6 A
     0A9E 027B A
     0A9F 03D8 A
     0AA0 030B A
1905 0AA1 0289 A  FORG1:  .WORD   R,OVER,LESS,ZBRAN
     0AA2 02C9 A
     0AA3 045D A
     0AA4 0124 A
1906 0AA5 0009 A         .WORD    FORG2-.,FORTH,DEFIN
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        0AA6 083F A
        0AA7 084B A
1907    0AA8 030B A            .WORD   AT,DUP,VOCL,STORE,BRAN
        0AA9 02DD A
        0AAA 03D8 A
        0AAB 031D A
        0AAC 011B A
1908    0AAD FFF4 A            .WORD   FORG1-.
1909    0AAE 02DD A  FORG2:    .WORD   DUP,TWO,SUB
        0AAF 037E A
        0AB0 0450 A
1910    0AB1 04C0 A  FORG3:    .WORD   PFA,LFA,AT,DUP,R,LESS,ZBRAN
        0AB2 04A3 A
        0AB3 030B A
        0AB4 02DD A
        0AB5 0289 A
        0AB6 045D A
        0AB7 0124 A
1911    0AB8 FFF9 A            .WORD   FORG3-.,OVER,ONE,SUB,STORE
        0AB9 02C9 A
        0ABA 037A A
        0ABB 0450 A
        0ABC 031D A
1912    0ABD 030B A            .WORD   AT,DDUP,ZEQU,ZBRAN
        0ABE 047D A
        0ABF 028F A
        0AC0 0124 A
1913    0AC1 FFED A            .WORD   FORG2-.,FROMR,DP,STORE,SEMIS
        0AC2 0283 A
        0AC3 03D0 A
        0AC4 031D A
        0AC5 026A A
1914                        ;
1915                        ;***************************************************
1916                        ;*           CONDITIONAL COMPILER, PER SHIRA        *
1917                        ;***************************************************
1918                        ;
1919    0AC6 8442 A            HEAD    ORD,4,LONG,'B'/256
1920    0AC7 4143 A            .WORD   'AC','K'+EVEN,FORGET-5
        0AC8 CB20 A
        0AC9 0A87 A
1921    0ACA 0342 A  BACK:     .WORD   DOCOL,HERE,SUB,COMMA,SEMIS
        0ACB 043A A
        0ACC 0450 A
        0ACD 0448 A
        0ACE 026A A
1922                        ;
1923    0ACF C542 A            HEAD    IMM,5,LONG,'B'/256
1924    0AD0 4547 A            .WORD   'EG','IN'+ODD,BACK-4
        0AD1 49CE A
        0AD2 0AC6 A
1925    0AD3 0342 A  BEGIN:    .WORD   DOCOL,QCOMP,HERE,ONE,SEMIS
        0AD4 04E3 A
        0AD5 043A A
        0AD6 037A A
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          0AD7 026A A
1926                        ;
1927 0AD8 C545 A                 HEAD      IMM,5,LONG,'E'/256
1928 0AD9 4E44 A                 .WORD     'ND','IF'+ODD,BEGIN-4
     0ADA 49C6 A
     0ADB 0ACF A
1929 0ADC 0342 A    ENDIF:      .WORD     DOCOL,QCOMP,TWO,QPAIRS,HERE
     0ADD 04E3 A
     0ADE 037E A
     0ADF 04FB A
     0AE0 043A A
1930 0AE1 02C9 A                 .WORD     OVER,SUB,SWAP,STORE,SEMIS
     0AE2 0450 A
     0AE3 02D5 A
     0AE4 031D A
     0AE5 026A A
1931                        ;
1932 0AE6 C454 A                 HEAD      IMM,4,LONG,'T'/256
1933 0AE7 4845 A                 .WORD     'HE','N'+EVEN,ENDIF-4
     0AE8 CE20 A
     0AE9 0AD8 A
1934 0AEA 0342 A    THEN:       .WORD     DOCOL,ENDIF,SEMIS
     0AEB 0ADC A
     0AEC 026A A
1935                        ;
1936 0AED C244 A                 HEAD      IMM,2,LONG,'D'/256
1937 0AEE CF20 A                 .WORD     'O'+EVEN,THEN-4
     0AEF 0AE6 A
1938 0AF0 0342 A    DO:         .WORD     DOCOL,COMPIL,XDO
     0AF1 0521 A
     0AF2 0155 A
1939 0AF3 043A A                 .WORD     HERE,THREE,SEMIS
     0AF4 0382 A
     0AF5 026A A
1940                        ;
1941 0AF6 C44C A                 HEAD      IMM,4,LONG,'L'/256
1942 0AF7 4F4F A                 .WORD     'OO','P'+EVEN,DO-3
     0AF8 D020 A
     0AF9 0AED A
1943 0AFA 0342 A    LOOP:       .WORD     DOCOL,THREE,QPAIRS,COMPIL
     0AFB 0382 A
     0AFC 04FB A
     0AFD 0521 A
1944 0AFE 012F A                 .WORD     XLOOP,BACK,SEMIS
     0AFF 0ACA A
     0B00 026A A
1945                        ;
1946 0B01 C52B A                 HEAD      IMM,5,LONG,'+'/256
1947 0B02 4C4F A                 .WORD     'LO','OP'+ODD,LOOP-4
     0B03 4FD0 A
     0B04 0AF6 A
1948 0B05 0342 A    PLOOP:      .WORD     DOCOL,THREE,QPAIRS,COMPIL
     0B06 0382 A
     0B07 04FB A
     0B08 0521 A
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1949 0B09 0140 A                    .WORD    XPLOOP,BACK,SEMIS
     0B0A 0ACA A
     0B0B 026A A
1950                    ;
1951 0B0C C555 A             HEAD    IMM,5,LONG,'U'/256
1952 0B0D 4E54 A             .WORD   'NT','IL'+ODD,PLOOP-4
     0B0E 49CC A
     0B0F 0B01 A
1953 0B10 0342 A  UNTIL:     .WORD   DOCOL,ONE,QPAIRS,COMPIL
     0B11 037A A
     0B12 04FB A
     0B13 0521 A
1954 0B14 0124 A             .WORD   ZBRAN,BACK,SEMIS
     0B15 0ACA A
     0B16 026A A
1955                    ;
1956 0B17 C345 A             HEAD    IMM,3,LONG,'E'/256
1957 0B18 4EC4 A             .WORD   'ND'+ODD,UNTIL-4
     0B19 0B0C A
1958 0B1A 0342 A  END:       .WORD   DOCOL,UNTIL,SEMIS
     0B1B 0B10 A
     0B1C 026A A
1959                    ;
1960 0B1D C541 A             HEAD    IMM,5,LONG,'A'/256
1961 0B1E 4741 A             .WORD   'GA','IN'+ODD,END-3
     0B1F 49CE A
     0B20 0B17 A
1962 0B21 0342 A  AGAIN:     .WORD   DOCOL,ONE,QPAIRS,COMPIL
     0B22 037A A
     0B23 04FB A
     0B24 0521 A
1963 0B25 011B A             .WORD   BRAN,BACK,SEMIS
     0B26 0ACA A
     0B27 026A A
1964                    ;
1965 0B28 C652 A             HEAD    IMM,6,LONG,'R'/256
1966 0B29 4550 A             .WORD   'EP','EA','T'+EVEN,AGAIN-4
     0B2A 4541 A
     0B2B D420 A
     0B2C 0B1D A
1967 0B2D 0342 A  REPEAT:    .WORD   DOCOL,TOR,TOR,AGAIN,FROMR
     0B2E 027B A
     0B2F 027B A
     0B30 0B21 A
     0B31 0283 A
1968 0B32 0283 A             .WORD   FROMR,TWO,SUB,ENDIF,SEMIS
     0B33 037E A
     0B34 0450 A
     0B35 0ADC A
     0B36 026A A
1969                    ;
1970 0B37 C249 A             HEAD    IMM,2,LONG,'I'/256
1971 0B38 C620 A             .WORD   'F'+EVEN,REPEAT-5
     0B39 0B28 A
1972 0B3A 0342 A  IF:        .WORD   DOCOL,COMPIL,ZBRAN,HERE
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            0B3B 0521 A
            0B3C 0124 A
            0B3D 043A A
1973 0B3E 0376 A                    .WORD     ZERO,COMMA,TWO,SEMIS
            0B3F 0448 A
            0B40 037E A
            0B41 026A A
1974                        ;
1975 0B42 C445 A                    HEAD      IMM,4,LONG,'E'/256
1976 0B43 4C53 A                    .WORD     'LS','E'+EVEN,IF-3
            0B44 C520 A
            0B45 0B37 A
1977 0B46 0342 A          ELSE:     .WORD     DOCOL,TWO,QPAIRS,COMPIL
            0B47 037E A
            0B48 04FB A
            0B49 0521 A
1978 0B4A 011B A                    .WORD     BRAN,HERE,ZERO,COMMA
            0B4B 043A A
            0B4C 0376 A
            0B4D 0448 A
1979 0B4E 02D5 A                    .WORD     SWAP,TWO,ENDIF,TWO,SEMIS
            0B4F 037E A
            0B50 0ADC A
            0B51 037E A
            0B52 026A A
1980                        ;
1981 0B53 C557 A                    HEAD      IMM,5,LONG,'W'/256
1982 0B54 4849 A                    .WORD     'HI','LE'+ODD,ELSE-4
            0B55 4CC5 A
            0B56 0B42 A
1983 0B57 0342 A          WHILE:    .WORD     DOCOL,IF,TWOP,SEMIS
            0B58 0B3A A
            0B59 0432 A
            0B5A 026A A
1984                        ;
1985                        ;*******************************************
1986                        ;*              NUMERIC PRIMITIVES          *
1987                        ;*******************************************
1988                        ;
1989 0B5B 8653 A                    HEAD      ORD,6,LONG,'S'/256
1990 0B5C 5041 A                    .WORD     'PA','CE','S'+EVEN,WHILE-4
            0B5D 4345 A
            0B5E D320 A
            0B5F 0B53 A
1991 0B60 0342 A          SPACES:   .WORD     DOCOL,ZERO,MAX,DDUP,ZBRAN
            0B61 0376 A
            0B62 08D7 A
            0B63 047D A
            0B64 0124 A
1992 0B65 0006 A                    .WORD     SPACE2-.,ZERO,XDO
            0B66 0376 A
            0B67 0155 A
1993 0B68 0475 A          SPACE1:   .WORD     SPACE,XLOOP
            0B69 012F A
1994 0B6A FFFE A                    .WORD     SPACE1-.
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1995  0B6B  026A  A    SPACE2:  .WORD    SEMIS
1996                            ;
1997                            ;     : <,    PAD   BYTE   HLD   !   ;
1998                            ;
1999  0B6C  823C  A            HEAD     ORD,2,LONG,'<'/256
2000  0B6D  A320  A            .WORD    ','+EVEN,SPACES-5
      0B6E  0B5B  A
2001  0B6F  0342  A    BDIGS:   .WORD    DOCOL,PAD,BYTE,HLD,STORE,SEMIS
      0B70  0686  A
      0B71  02FD  A
      0B72  0426  A
      0B73  031D  A
      0B74  026A  A
2002                            ;
2003                            ;     : ,>    DROP   DROP   HLD   @
2004                            ;            PAD   BYTE   OVER   +   ;
2005                            ;
2006  0B75  8223  A            HEAD     ORD,2,LONG,','/256
2007  0B76  BE20  A            .WORD    '>'+EVEN,BDIGS-3
      0B77  0B6C  A
2008  0B78  0342  A    EDIGS:   .WORD    DOCOL,DROP,DROP,HLD,AT
      0B79  02D0  A
      0B7A  02D0  A
      0B7B  0426  A
      0B7C  030B  A
2009  0B7D  0686  A            .WORD    PAD,BYTE,OVER,SUB,SEMIS
      0B7E  02FD  A
      0B7F  02C9  A
      0B80  0450  A
      0B81  026A  A
2010                            ;
2011  0B82  8453  A            HEAD     ORD,4,LONG,'S'/256
2012  0B83  4947  A            .WORD    'IG','N'+EVEN,EDIGS-3
      0B84  CE20  A
      0B85  0B75  A
2013  0B86  0342  A    SIGN:    .WORD    DOCOL,ROT,ZLESS,ZBRAN
      0B87  046A  A
      0B88  0297  A
      0B89  0124  A
2014  0B8A  0004  A            .WORD    SIGN1-.,LIT,'-'/256,HOLD
      0B8B  0103  A
      0B8C  002D  A
      0B8D  067A  A
2015  0B8E  026A  A    SIGN1:   .WORD    SEMIS
2016                            ;
2017  0B8F  81A3  A            HEAD     ORD,1,SHORT,','/256
2018  0B90  0B82  A            .WORD    SIGN-4
2019  0B91  0342  A    DIG:     .WORD    DOCOL,BASE,AT,MSMOD,ROT
      0B92  040D  A
      0B93  030B  A
      0B94  0933  A
      0B95  046A  A
2020  0B96  0103  A            .WORD    LIT,9,OVER,LESS,ZBRAN
      0B97  0009  A
      0B98  02C9  A
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        0B99 045D  A
        0B9A 0124  A
 2021   0B9B 0004  A              .WORD    DIG1-.,LIT,7,PLUS
        0B9C 0103  A
        0B9D 0007  A
        0B9E 029F  A
 2022   0B9F 0103  A   DIG1:      .WORD    LIT,0030,PLUS,HOLD,SEMIS
        0BA0 0030  A
        0BA1 029F  A
        0BA2 067A  A
        0BA3 026A  A
 2023                  ;
 2024   0BA4 8223  A              HEAD     ORD,2,LONG,',',/256
 2025   0BA5 D320  A              .WORD    'S'+EVEN,DIG-2
        0BA6 0B8F  A
 2026   0BA7 0342  A   DIGS:      .WORD    DOCOL
 2027   0BA8 0B91  A   DIGS1:     .WORD    DIG,OVER,OVER,OR,ZEQU,ZBRAN
        0BA9 02C9  A
        0BAA 02C9  A
        0BAB 0246  A
        0BAC 028F  A
        0BAD 0124  A
 2028   0BAE FFFA  A              .WORD    DIGS1-.,SEMIS
        0BAF 026A  A
 2029                  ;
 2030                  ;*********************************************************
 2031                  ;*                 OUTPUT OPERATORS                      *
 2032                  ;*********************************************************
 2033                  ;
 2034   0BB0 8344  A              HEAD     ORD,3,LONG,'D'/256
 2035   0BB1 2ED2  A              .WORD    '.R'+ODD,DIGS-3
        0BB2 0BA4  A
 2036   0BB3 0342  A   DDOTR:     .WORD    DOCOL,TOR,SWAP,OVER,DABS
        0BB4 027B  A
        0BB5 02D5  A
        0BB6 02C9  A
        0BB7 08C8  A
 2037   0BB8 0B6F  A              .WORD    BDIGS,DIGS,SIGN,EDIGS,FROMR
        0BB9 0BA7  A
        0BBA 0B86  A
        0BBB 0B78  A
        0BBC 0283  A
 2038   0BBD 02C9  A              .WORD    OVER,SUB,SPACES,TYPE,SEMIS
        0BBE 0450  A
        0BBF 0B60  A
        0BC0 0599  A
        0BC1 026A  A
 2039                  ;
 2040   0BC2 822E  A              HEAD     ORD,2,LONG,'.'/256
 2041   0BC3 D220  A              .WORD    'R'+EVEN,DDOTR-3
        0BC4 0BB0  A
 2042   0BC5 0342  A   DOTR:      .WORD    DOCOL,TOR,STOD,FROMR,DDOTR,SEMIS
        0BC6 027B  A
        0BC7 08A5  A
        0BC8 0283  A
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          OBC9  OBB3  A
          OBCA  026A  A
2043                          ;
2044 OBCB 8244  A                     HEAD      ORD,2,LONG,'D'/256
2045 OBCC AE20  A                     .WORD     '.'+EVEN,DOTR-3
     OBCD OBC2  A
2046 OBCE 0342  A             DDOT:    .WORD     DOCOL,ZERO,DDOTR,SPACE,SEMIS
     OBCF 0376  A
     OBD0 OBB3  A
     OBD1 0475  A
     OBD2 026A  A
2047                          ;
2048 OBD3 81AE  A                     HEAD      ORD,1,SHORT,'.'/256
2049 OBD4 OBCB  A                     .WORD     DDOT-3
2050 OBD5 0342  A             DOT:     .WORD     DOCOL,STOD,DDOT,SEMIS
     OBD6 08A5  A
     OBD7 OBCE  A
     OBD8 026A  A
2051                          ;
2052 OBD9 81BF  A                     HEAD      ORD,1,SHORT,'?'/256
2053 OBDA OBD3  A                     .WORD     DOT-2
2054 OBDB 0342  A             QUES:    .WORD     DOCOL,AT,DOT,SEMIS
     OBDC 030B  A
     OBDD OBD5  A
     OBDE 026A  A
2055                          ;
2056 OBDF 8255  A                     HEAD      ORD,2,LONG,'U'/256
2057 OBE0 AE20  A                     .WORD     '.'+EVEN,QUES-2
     OBE1 OBD9  A
2058 OBE2 0342  A             UDOT:    .WORD     DOCOL,ZERO,DDOT,SEMIS
     OBE3 0376  A
     OBE4 OBCE  A
     OBE5 026A  A
2059                          ;
2060                          ;*************************************************
2061                          ;*           PROGRAM DOCUMENTATION              *
2062                          ;*************************************************
2063                          ;
2064 OBE6 844C  A                     HEAD      ORD,4,LONG,'L'/256
2065 OBE7 4953  A                     .WORD     'IS','T'+EVEN,UDOT-3
     OBE8 D420  A
     OBE9 OBDF  A
2066 OBEA 0342  A             LIST:    .WORD     DOCOL,CR,DUP,SCR,STORE,PDOTQ
     OBEB 01FC  A
     OBEC 02DD  A
     OBED 03EC  A
     OBEE 031D  A
     OBEF 05CA  A
2067 OBF0 0653  A                     STRING    6,'S'/256
2068 OBF1 4352  A                     .ASCII    'CR , '
     OBF2 2023  A
     OBF3 2020  A
2069 OBF4 OBD5  A                     .WORD     DOT,LIT,16,ZERO,XDO
     OBF5 0103  A
     OBF6 0010  A
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        0BF7 0376 A
        0BF8 0155 A
2070    0BF9 01FC A    LIST1:  .WORD    CR,I,ZERO,THREE,DDOTR,SPACE
        0BFA 0161 A
        0BFB 0376 A
        0BFC 0382 A
        0BFD 0BB3 A
        0BFE 0475 A
2071    0BFF 0161 A            .WORD    I,SCR,AT,DLINE,XLOOP
        0C00 03EC A
        0C01 030B A
        0C02 09FB A
        0C03 012F A
2072    0C04 FFF5 A            .WORD    LIST1-.,CR,SEMIS
        0C05 01FC A
        0C06 026A A
2073                    ;
2074    0C07 8549 A            HEAD     ORD,5,LONG,'I'/256
2075    0C08 4E44 A            .WORD    'ND','EX'+ODD,LIST-4
        0C09 45D8 A
        0C0A 0BE6 A
2076    0C0B 0342 A    INDEX:  .WORD    DOCOL,LIT,000C,EMIT
        0C0C 0103 A
        0C0D 000C A
        0C0E 01ED A
2077    0C0F 01FC A            .WORD    CR,ONEP,SWAP,XDO
        0C10 042B A
        0C11 02D5 A
        0C12 0155 A
2078    0C13 01FC A    INDEX1: .WORD    CR,I,ZERO,THREE,DDOTR,SPACE
        0C14 0161 A
        0C15 0376 A
        0C16 0382 A
        0C17 0BB3 A
        0C18 0475 A
2079    0C19 0376 A            .WORD    ZERO,I,DLINE,QTERM,ZBRAN
        0C1A 0161 A
        0C1B 09FB A
        0C1C 01F8 A
        0C1D 0124 A
2080    0C1E 0002 A            .WORD    INDEX2-.,LEAVE
        0C1F 0273 A
2081    0C20 012F A    INDEX2: .WORD    XLOOP
2082    0C21 FFF2 A            .WORD    INDEX1-.,SEMIS
        0C22 026A A
2083                    ;
2084    0C23 8554 A            HEAD     ORD,5,LONG,'T'/256
2085    0C24 5249 A            .WORD    'RI','AD'+ODD,INDEX-4
        0C25 41C4 A
        0C26 0C07 A
2086    0C27 0342 A    TRIAD:  .WORD    DOCOL,LIT,000C,EMIT,THREE
        0C28 0103 A
        0C29 000C A
        0C2A 01ED A
        0C2B 0382 A
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2087 0C2C 0911 A                 .WORD   SLASH,THREE,STAR,THREE
     0C2D 0382 A
     0C2E 0901 A
     0C2F 0382 A
2088 0C30 02C9 A                 .WORD   OVER,PLUS,SWAP,XDO
     0C31 029F A
     0C32 02D5 A
     0C33 0155 A
2089 0C34 01FC A    TRIAD1: .WORD   CR,I,LIST,XLOOP
     0C35 0161 A
     0C36 0BEA A
     0C37 012F A
2090 0C38 FFFC A                 .WORD   TRIAD1-.,CR,LIT,000F
     0C39 01FC A
     0C3A 0103 A
     0C3B 000F A
2091 0C3C 0A05 A                 .WORD   MESS,CR,SEMIS
     0C3D 01FC A
     0C3E 026A A
2092              ;
2093              ;*********************************************
2094              ;*                    TOOLS                  *
2095              ;*********************************************
2096              ;
2097 0C3F 8556 A          HEAD    ORD,5,LONG,'V'/256
2098 0C40 4C49 A                 .WORD   'LI','ST'+ODD,TRIAD-4
     0C41 53D4 A
     0C42 0C23 A
2099 0C43 0342 A    VLIST:  .WORD   DOCOL,LIT,0080,OUT,STORE
     0C44 0103 A
     0C45 0080 A
     0C46 03E7 A
     0C47 031D A
2100 0C48 03FA A                 .WORD   CONT,AT,AT
     0C49 030B A
     0C4A 030B A
2101 0C4B 03E7 A    VLIST1: .WORD   OUT,AT,LIT,0040,GREAT,ZBRAN
     0C4C 030B A
     0C4D 0103 A
     0C4E 0040 A
     0C4F 0463 A
     0C50 0124 A
2102 0C51 0005 A                 .WORD   VLIST2-.,CR,ZERO,OUT,STORE
     0C52 01FC A
     0C53 0376 A
     0C54 03E7 A
     0C55 031D A
2103 0C56 02DD A    VLIST2: .WORD   DUP,IDDOT,SPACE,SPACE
     0C57 075D A
     0C58 0475 A
     0C59 0475 A
2104 0C5A 04C0 A                 .WORD   PFA,LFA,AT,DUP,ZEQU
     0C5B 04A3 A
     0C5C 030B A
     0C5D 02DD A
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        0C5E 028F A
 2105   0C5F 01F8 A              .WORD    QTERM,OR,ZBRAN
        0C60 0246 A
        0C61 0124 A
 2106   0C62 FFE9 A              .WORD    VLIST1-.,DROP,SEMIS
        0C63 02D0 A
        0C64 026A A
 2107                  ;
 2108   0C65 8454 A              HEAD     ORD,4,LONG,'T'/256
 2109   0C66 4153 A              .WORD    'AS','K'+EVEN,VLIST-4
        0C67 CB20 A
        0C68 0C3F A
 2110   0C69 0342 A   TASK:      .WORD    DOCOL,SEMIS
        0C6A 026A A
 2111
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                                  .PAGE
 2112                  ;
 2113        088C      FIN:       .END     CENT
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        00F6 02A2 A
        00F7 0108 A
        00F8 0109 A
        00F9 0107 A
        00FA 015D A
        00FB 015C A
        00FC 7E44 A
        00FD 7E3B A
        00FE 7ECC A
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Name	Addr		Name	Addr		Name	Addr	
ABORT	0874	A	ABS	08C0	A	AGAIN	0B21	A
ALLOT	0442	A	AND	023F	A	ARROW	0A3B	A
AT	030B	A	BACK	0ACA	A	BACKSP	0017	A*
BAD	0175	A	BASE	040D	A	BBUF	0399	A
BCOMP	07AF	A	BDIGS	0B6F	A	BEGIN	0AD3	A
BIN	02A2	A	BIT0	0003	A	BL	0387	A
BLANKS	0671	A	BLK	03DD	A	BLKSIZ	0080	A
BLOCK	09B6	A	BLOCK1	09C5	A	BLOCK2	09D2	A
BLOCK3	09DE	A	BRAN	011B	A	BSCR	039F	A
BUFF1	0997	A	BUFF2	09AA	A	BUFFER	0992	A
BUFFS	1DF0	A	BUFMEM	0210	A	BUILDS	0575	A
BYTE	02FD	A	CAT	0311	A	CELL	0305	A
CENT	088C	A	CFA	04AA	A	CKBASE	016F	A
CMOVE	0690	A	CMOVE1	0698	A	CMOVE2	06A1	A
CMOVE3	06A2	A	COLD	088B	A	COLON	0338	A
COMMA	0448	A	COMPIL	0521	A	CON	0357	A
CONT	03FA	A	COUNT	058E	A	CPU	0014	A*
CR	01FC	A	CREAT1	078C	A	CREATE	0779	A
CRY	0007	A	CSET	000A	A	CSP	041C	A
CSTORE	0324	A	CURR	0401	A	CYCLE	018A	A
DABS	08C8	A	DDOT	0BCE	A	DDOTR	0BB3	A
DDUP	047D	A	DEC	0553	A	DEFIN	084B	A
DELIM	01DA	A	DFIND	0727	A	DFIND1	0737	A
DICT	0100	A	DIG	0B91	A	DIG1	0B9F	A
DIGIT	0166	A	DIGS	0BA7	A	DIGS1	0BA8	A
DLINE	09FB	A	DLITE1	07D4	A	DLITER	07CC	A
DMINUS	02BD	A	DO	0AF0	A	DOCOL	0342	A
DOCON	035C	A	DODOES	0583	A	DOES	057D	A
DOT	0BD5	A	DOTQ	05D8	A	DOTQ1	05EA	A
DOTQ2	05EE	A	DOTR	0BC5	A	DOUSER	0371	A
DOVAR	0367	A	DOVOC	0837	A	DP	03D0	A
DP0	001F	A*	DPL	0412	A	DPLUS	02A7	A
DPMI	08B7	A	DPMI1	08BC	A	DRONE	097F	A
DROP	02D0	A	DRTWO	0987	A	DTRA1	05B4	A
DTRA2	05C1	A	DTRA3	05C3	A	DTRAIL	05B0	A
DUP	02DD	A	EDIGS	0B78	A	ELSE	0B46	A
EMIT	01ED	A	ENCL	01B1	A	END	0B1A	A
ENDIF	0ADC	A	ENDNAM	01A1	A	EQUAL	0457	A
ERASE	0668	A	ERROR	0744	A	ERROR1	074B	A

EVEN	8000	A	EXEC	0112	A	EXPEC1	05F9	A
EXPEC2	0611	A	EXPEC3	061D	A	EXPEC4	061E	A
EXPEC5	0624	A	EXPECT	05F4	A	FENCE	03CB	A
FENCE0	001E	A*	FILL	0658	A	FIN	0C6B	A
FIRST	038D	A	FLD	0417	A	FORG1	0AA1	A
FORG2	0AAE	A	FORG3	0AB1	A	FORGET	0A8C	A
FORTH	083F	A	FORTH0	0016	A*	FOUND	0194	A
FROMR	0283	A	GETC	7E3B	A	GREAT	0463	A
HEAD	FORM		HERE	043A	A	HEX	0548	A
HI	0A59	A	HIBLK	3FC0	A	HLD	0426	A
HOLD	067A	A	I	0161	A	IDDOT	075D	A
IF	0B3A	A	IMM	0001	A	IMMED	0819	A
IN	03E2	A	INDEX	0C0B	A	INDEX1	0C13	A
INDEX2	0C20	A	INIT	0023	A	INTER	07F1	A
INTER1	07F2	A	INTER2	07FE	A	INTER3	0800	A
INTER4	0803	A	INTER5	080D	A	INTER6	080F	A
INTER7	0810	A	INTEST	7ECC	A	IP	0001	A
IP0	089F	A	KEY	01F1	A	LATEST	049B	A
LBRAC	052C	A	LDUP	0894	A	LDUVS	0896	A
LEAVE	0273	A	LESS	045D	A	LFA	04A3	A
LIMIT	0393	A	LINK	0008	A	LIST	0BEA	A
LIST1	0BF9	A	LIT	0103	A	LITER	07BD	A
LITER1	07C5	A	LMASK	01E7	A	LNDEL	01CB	A
LO	0A5E	A	LOAD	0A22	A	LOBLK	2000	A
LONG	0000	A	LOOP	0AFA	A	LP	0219	A
M	000B	A	MAX	08D7	A	MESS	0A05	A
MESS1	0A15	A	MESS2	0A17	A	MESS3	0A1D	A
MIN	08CF	A	MIN1	023B	A	MINUS	02B4	A
MINUS1	0223	A	MISS	019C	A	MOD	0919	A
MOVE	0201	A	MOVE1	0207	A	MOVE2	020E	A
MSLASH	08EE	A	MSMOD	0933	A	MSTAR	08DF	A
MTBUF	0975	A	NBUF	0008	A	NEW1	01BE	A
NEW2	01CD	A	NEWNAM	0181	A	NEXT	0109	A
NFA	04B1	A	NINE	0177	A	NONUL	01D6	A
NUL	01D1	A	NULL	063A	A	NULL1	064F	A
NULL2	0651	A	NULL3	0653	A	NUMB	06FA	A
NUMB1	070A	A	NUMB2	071D	A	NUMB3	0722	A
NZ	0005	A	ODD	0080	A	OFFSET	03F3	A
ONE	037A	A	ONEP	042B	A	OR	0246	A
ORD	0000	A	ORGPTR	08A0	A	ORIG	0010	A
OUT	03E7	A	OVER	02C9	A	P	0002	A
PABORT	073D	A	PAD	0686	A	PAREN	0853	A
PART	0002	A	PBUF	094D	A	PBUF1	0958	A
PCR	0A53	A	PDOTQ	05CA	A	PEMIT	0A49	A
PFA	04C0	A	PFIND	017D	A	PKEY	0A4D	A
PLINE	09E7	A	PLOOP	0B05	A	PLUS	029F	A
PMI	08AE	A	PMI1	08B3	A	PNUMB	06D4	A
PNUMB1	06D5	A	PNUMB2	06F0	A	PNUMB3	06F3	A
POOL	0230	A	POP	015D	A	POP2	015C	A
PORIG	03A6	A	PQTERM	0A4F	A	PREV	0947	A
PSCODE	055E	A	PSTORE	02E3	A	PULL	014F	A
PUSH	0107	A	PUT	0108	A	PUTC	7E44	A
QCOMP	04E3	A	QCSP	0505	A	QERR1	04DD	A
QERR2	04DE	A	QERROR	04D6	A	QEXEC	04EF	A
QLOAD	0514	A	QPAIRS	04FB	A	QSTACK	07DA	A

QTERM	01F8	A	QUAD	0000	A	QUERY	062D	A
QUES	0BDB	A	QUIT	085C	A	QUIT1	0861	A
QUIT2	086D	A	R	0289	A	R0	001A	A*
RBRAC	0533	A	REPEAT	0B2D	A	REV	0015	A*
RMASK	01E8	A	RNDEL	01CA	A	RNUM	0421	A
ROT	046A	A	RP	0021	A	RPSTOR	0262	A
RT1	01C4	A	RT2	01DD	A	RW	0A63	A
RW1	0A79	A	RZERO	03B3	A	S0	0019	A*
SCR	03EC	A	SCSP	04CC	A	SEMI	034A	A
SEMIC	0569	A	SEMIS	026A	A	SHORT	0001	A
SIGN	0B86	A	SIGN1	0B8E	A	SLASH	0911	A
SLMOD	0909	A	SMUDGE	053E	A	SP	0003	A
SPACE	0475	A	SPACE1	0B68	A	SPACE2	0B6B	A
SPACES	0B60	A	SPAT	0255	A	SPSTOR	025B	A
SSLASH	092A	A	SSMOD	0921	A	STAR	0901	A
START	089E	A	STATE	0407	A	STOD	08A5	A
STORE	031D	A	STRING	FORM		SUB	0450	A
SWAP	02D5	A	SZERO	03AE	A	TASK	0C69	A
TEST	021E	A	THEN	0AEA	A	THREE	0382	A
TIB	03B8	A	TIB0	001B	A*	TICK	0A7F	A
TOGGLE	02ED	A	TOPMEM	2000	A	TOR	027B	A
TRAV	0488	A	TRAV1	048A	A	TRIAD	0C27	A
TRIAD1	0C34	A	TWO	037E	A	TWOP	0432	A
TYPE	0599	A	TYPE1	05A1	A	TYPE2	05A8	A
TYPE3	05A9	A	U0	0018	A*	UDOT	0BE2	A
UNTIL	0B10	A	UP	0022	A	UPDATE	0962	A
USE	0941	A	USER	036E	A	USLASH	0227	A
USTAR	0213	A	UVARS	1DD0	A	VAR	0364	A
VLIST	0C43	A	VLIST1	0C4B	A	VLIST2	0C56	A
VOCAB	0827	A	VOCL	03D8	A	VOCL0	0020	A*
W	0002	A	WARN	03C5	A	WARN0	001D	A*
WENT	0892	A	WHILE	0B57	A	WIDTH	03BE	A
WIDTH0	001C	A*	WORD	06A8	A	WORD1	06B2	A
WORD2	06B4	A	X	0002	A	X00FF	0335	A
X3FFF	01A8	A	X7F7F	01A9	A	X8080	01AB	A
XDO	0155	A	XFF	031A	A	XFF00	01AA	A
XLOOP	012F	A	XLOOP1	0137	A	XOR	024D	A
XPLOOP	0140	A	Y	0003	A	Z	0001	A
ZBRAN	0124	A	ZEQU	028F	A	ZERO	0376	A
ZLESS	0297	A						

NO ERROR LINES
SOURCE CHECKSUM : E77A
    A   ZEQU   028F   A   ZERO   0376   A